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## RECEIVER FOR TOWNSEND-DOWNEY COMPANY.

In the United States circuit court of New York this week Henry E. Ide was appointed receiver for the Townsend-Downey Ship Building Co., Shooter's Island, N. Y., on an affidavit filed by the Ansonia Brass & Copper Co. In a second affidavit the firm of E. L. Mesick & Co. asks that the company be declared involuntary bankrupts. He states in his affidavit that the capital stock of the company is \$3,500,000 and that there is property in the yards and offices worth \$75,000. It is related that the present plight of the company is due to labor troubles, repeated strikes and some losses which have arisen from two disadvantageous contracts. The company is confident of its ability to reorganize and it is the desire of creditors to co-operate to that end as far as possible. The following notice was posted at the office of the company:

"The temporary embarrassment of the Townsend-Downey Ship Building Co. is directly the result of losses and delay in performing contracts, incurred through the abominable conditions prevailing in the labor and material market during the past two years. The exorbitant demands of the workmen and restriction of the volume of work done, added to the impossibility of securing promptly from steel manufacturers material for ship construction, have rendered it impossible to operate to advantage. These difficulties and the fact that the credit of the ship building industry has been completely destroyed by recent revelations regarding the promotion of the United States Ship Building Co. have for a time prevented the carrying out of the legitimate plans of the company. The company has a valuable property and a modern-equipped plant for ship building, dry docking, and ship repairs, and after adjustment of present difficulties will undoubtedly resume business."

## BIDS FOR TWO BATTLESHIPS.

Bids will be solicited by the navy department within the next two or three weeks for the construction of the two 13,000-ton battleships Mississippi and Idaho. The maximum time allowed for the completion of the vessels is forty-two months and no bid will be considered which proposes to exceed that limit. The general dimensions and features of the vessels are as follows: Length on load water line, 375 ft.; breadth extreme at load water line, 77 ft.; mean draught, 24 ft. 8 in.; displacement, 13,000 tons; speed 17 knots. The engines will be of the vertical, twin-screw, triple-expansion type of an indicated horse power of 10,000. Steam will be generated by eight water-tube boilers placed in four watertight compartments. The armament of the vessels will include a main battery of four 12-in. breech-loading rifles, eight 8-in. breech loading rifles, eight 7-in. breech-loading rifles, and two 18-in. submerged torpedo tubes; and a secondary battery of twelve 3-in. 14-pounder rapid-fire guns, six 3-pounder semi-automatic guns, two 1-pounder rapid-fire guns, two 3-in. field pieces, two machine guns of .30 caliber, and six automatic guns of .30 caliber.

## REPUBLIC IRON & STEEL PASSES DIVIDEND.

At a meeting of the directors of the Republic Iron & Steel Co., held in New York last week, it was decided to pass the preferred dividend. It was deemed best to do so until a working capital sufficient to meet the operating expenses of the company was accumulated. Since the election of Alex. W. Thompson as president the policy of the corporation has been a very conservative one. In the neighborhood of \$6,000,000 has been used from earnings for improvements, additions and the general rehabilitation of plants. As a result the company is said to be in a very sound position physically, if not financially. After the meeting President Thompson gave out the following statement:

"In view of the present unsettled condition of the iron and steel industry, the directors deem it their duty to the stockholders to husband the company's resources and to increase its financial strength, and for those conditions decided to postpone the declaration of the usual dividend. The properties of the company are free from bonded indebtedness and the quick assets of the company are largely in excess of all its liabilities. The preference shares being cumulative, all dividends in arrears will be paid as soon as a change in the conditions will permit. Since the organization of the company more than \$6,000,000 have been expended for entirely new construction, which will give the company largely increased earnings as soon as the iron industry resumes its normal conditions."

The capital of the company is \$55,000,000, of which \$30,000,000 is common and \$25,000,000 is 7 per cent. cumulative preferred. Preferred dividends have been paid since the company was formed.

It is said that the net profits of the General Electric Co. for the current year will aggregate \$10,000,000.

## AMERICAN BOILER MANUFACTURERS' ASSOCIATION.

At the fifteenth annual convention of the American Boiler Manufacturers' association held in Chattanooga recently about 150 delegates and visitors were in attendance. President John O'Brien of St. Louis presided. Addresses of welcome were made by Hon. A. W. Chambliss, mayor of Chattanooga; C. A. Lyster, president of the Chattanooga Chamber of Commerce; C. D. Mitchell, president of the Chattanooga Manufacturers' association, and L. G. Walker of the local association of boiler makers. Responses to these addresses were made by W. H. S. Bateman of Philadelphia and James Lappan of Pittsburg, ex-president of the association.

Col. E. D. Meier, president of the Heine Safety Boiler Co. and chairman of the committee which has been working to get a revision of the marine boiler inspection rules, made a report to the effect that Secretaries Shaw and Cortelyou have agreed to recommend revision. Considerable complaint was made concerning the board of steamboat inspectors. In discussing the attitude of the supervisors various members spoke at length. It was stated that the supervisors, or many of them, are men of political appointment, knowing little of boiler practice, and, therefore, likely to be harmful rather than helpful. It was determined to continue the committee and to enlist the support of congressional representatives.

Probably the matter of revision would be further advanced than it is now were it not for some unsound advice given to the committee by Representative Grosvenor last February. He held that the secretaries had sufficient authority to divert certain appropriations for the appointment of a boiler commission and the boiler manufacturers left Washington with this impression. It was later discovered that this was not so, but it was too late to obtain a congressional enactment then. The committee will, therefore, go to Washington early during the present session to secure the passage of the necessary act. It is not anticipated that there will be any difficulty whatever in securing the passage of the act because all parties to the issue are entirely agreed upon it.

Discussion of the relative merits of the water-tube boiler and Scotch marine types of boilers for stationary use showed the majority to be in favor of the former. It was the opinion of the members that the association has accomplished considerable in the way of improvement of materials and workmanship in boiler construction. Officers for the past year were re-elected as follows: President, John O'Brien, St. Louis; first vice-president, Robert Monroe, Jr., Pittsburg; second vice-president, Samuel Borger, Columbus; third vice-president, J. M. Robinson, Boston; fourth vice-president, M. F. Cole, Newman, Georgia; fifth vice-president, J. F. Casey, Chattanooga; secretary, J. D. Farasey, Cleveland; treasurer, J. Wangler, St. Louis.

## SHIPPING TRADE OF THE PHILIPPINES.

Col. Clarence R. Edwards, chief of the bureau of insular affairs of the war department, has filed his annual report. The most interesting part of it deals with the shipping trade of the Philippines. Aside from the tariff question, the matter of most serious import is the enforcement of the congressional act requiring the carrying trade between the United States and the Philippines, as well as the coastwise trade of the islands, to be confined strictly after Jan. 1 next to vessels carrying the American flag. At the present time 59 per cent. of the foreign trade of the islands is carried in British ships. Other foreign vessels carried all but 3 per cent. of the remainder of this commerce. American ships are being constructed for this trade. The enforcement of the act, however, with reference to the coastwise trade, presents a more difficult problem. There are now 4,125 vessels engaged in the coastwise trade of the islands only twenty-two of them American ships. With the whole number of ships now participating in this trade the tonnage is said to be entirely inadequate and the passenger service wretched. It is suggested that the building of light draught vessels presents a splendid opportunity for investment of American capital, and the uncertainty as to probable future congressional action on this subject is asserted to be the reason why no steps are being taken to supply the coming imperative demand for American-built ships.

A board of naval officers, all former engineers, has submitted a report to the navy department, strongly asserting that steam turbine engines are adapted for naval purposes. This board has witnessed tests of turbine engines on a new yacht and reached the conclusion that, while the steam consumption ran more than 18 lbs. per horse power, the high speed given the turbine motors, and the small space required for them, the freedom of the vessel from vibration and the small danger of breakdown made turbines worthy of trial on naval vessels. It is believed that the navy department will endeavor to secure an appropriation for putting turbine motors in some of the torpedo boats.

## UP-TO-DATE INFORMATION REGARDING TURBINE.

Glasgow, Nov. 23.—I have just interviewed Messrs. James and Alexander Allan, owners of the Allan Line of steamers between Glasgow and Montreal, Liverpool and Montreal, River Plate and elsewhere. They courteously inform me that it is perfectly true they have, after mature consideration, determined to adopt the turbine on the next additions to their fleet. This they do after careful examination of the work that has been done by the few river and coasting turbine steamers already in existence, convinced that with the turbine motor they will secure more speed at less cost, enlarged space for cargo and passenger accommodation, economy in working, and entire absence of vibration on the ocean voyage. They admit that in being the first to adopt the turbine for ocean traffic they are taking a large amount of risk, but they are satisfied that circumstances, experience and probabilities justify them in assuming that risk. And, as they frankly say, nothing in this world worth having is to be got without risking something for it. The prize belongs to the man who dares. Only one of the two new boats so far decided upon has been as yet contracted for. She is placed with Workman, Clark & Co., Belfast, who also will supply the machinery. The turbine is to be of the Parsons' pattern, but whether or not the machinery be ordered from the Parsons company is for Workman, Clark & Co. to arrange. This is a detail into which the owners do not enter. They merely specify what they require and leave it to the ship builders to supply all. The new turbine Allan liner will be 540 ft. in length over all and 520 ft. perpendicular; 60 ft. in breadth and 40 ft. 6 in. in depth. She is to develop a speed of 17 to 18 knots with triple screw attachment. Her tonnage will be 12,000 and her power 30,000 I. H. P. By the economy of space from the new form of machinery she will have accommodation for some 1,300 passengers of all classes. And she is to be ready for service next summer. For cargo and passenger space she will be about one-fifth larger than the largest of the company's present fleet, and she will be about 2 knots faster. Messrs. Allan inform me that the contract for the second turbine boat has not yet been placed, but that the specifications are ready and negotiations are at such a stage that the contract will be signed almost immediately. She will be practically a sister ship. As to the general character of the new vessels they will be the same as those all ocean travelers are familiar with in the Allan Line, but with, of course, the addition of all the latest improvements for the handling of cargo and the comfort of passengers. Indeed, the turbine boat now building by Workman, Clark & Co. was laid down and partly constructed before the adoption of the turbine was resolved on. The difference from the former Allan liners will be in the larger space for all purposes afforded by the turbine machinery.

The considerations which have influenced the Allan Line owners in their important, and even epoch-making, decision are the results they have observed in the actual use of the turbine on the Clyde and elsewhere. They are in accord with Sir William White that the steam turbo-motor enables a saving of weight to be effected as compared with the quickest running and lightest reciprocal engines. The other important advantages are freedom from vibration, lessened expenditure on lubrication, upkeep and repairs, and reduced cost of supervision. In the Turbinia the total weight of machinery, boiler, shafting and propellers was 22 tons for an estimated horse power of over 2,000, nearly 100 H. P. per ton weight, or about twice the power in proportion to weight as compared with an ordinary destroyer. The turbines make from 2,000 to 2,200 revolutions as against 400 revolutions in the former case. With a much slower rate of revolution than in the Turbinia, and with additional turbines for going astern at good speed, it is believed to be possible to effect considerable proportionate economies of weight, or to increase speed. The destroyer Viper had turbine machinery practically identical in dimensions with other destroyers having reciprocating engines, and she attained a maximum speed of about 36.6 knots on an hour's trial, and about 34 knots for three hours with the contract load on board. The latter speed is about 3 knots greater than the corresponding speed on some of the best of the similar destroyers with reciprocating engines, and 4 knots above the guaranteed speed of the latter. Denny & Co. estimate that if the Clyde passenger steamer King Edward had been fitted with balanced twin triple-expansion engines of the best type instead of turbines in association with the same boilers, the speed would have been reduced from 20.5 to 19.7 knots—corresponding to a difference of 20 per cent. in horse power. In the steam yacht Lorena of 4,000 to 4,500 H. P. the original intention was to fit reciprocating engines. By fitting turbines 70 tons were saved in the weight of the machinery, and the engine-room space was made much less. In the turbine steamers now in the English channel service a gain of from 18 to 20 per cent. in weight has been obtained, including all boilers and machinery, and there was no increase in the cost of the machinery relative to speed over the reciprocating type of engines. After going thoroughly into all the circumstances and comparing all the records of all the turbine boats, the Allan Line has vigorously grasped the nettle which other owners are only dawdling with.

The Cunard turbine commission is making progress with its inquiry. Within a few weeks a series of practical trials will be undertaken to determine the economy of the system, and, as far as possible, its endurance. Work of the commission so far has been confined to the inspection of installations ashore and afloat, and to the collection of data as to the performance of turbines in electric light stations, where detailed records are kept. Members of the commission were greatly impressed with the economy in steam which these data invariably indicated, especially at full normal

load, under which condition Atlantic liner engines are worked from the time of departure to arrival. The commission will now charter for a short period the screw steamer Arundel and the turbine steamer Brighton, both built by Denny of Dumbarton, for the London, Brighton & South-Coast Co.'s service between New-haven and Dieppe. They are both the fruits of model experiments in the tank at the builder's yard and attain the highest propulsive economy on dimensions varying only to suit the mode of propulsion. The Arundel is 277 ft. long, 34 ft. beam, and at 14 ft. 6 in. draught displaces 1,310 tons. The Brighton is 282 ft. long and 34 ft. beam, the increased length giving accommodation for 1,000 instead of 900 passengers. The Arundel steams 21 knots for 5,600 I. H. P. The Brighton indicates 7,000 H. P. for about 22 knots. The commission will thoroughly test both vessels. They will weigh the water consumed, so that it will be possible to arrive at a close approximation of the relative steam consumption of the turbine and the reciprocating engines in driving the vessels at the same speed on a given draught and displacement.

## AMERICAN MATERIAL IN BRITAIN.

Glasgow, Nov. 23.—The sensation of the moment is the circulation of reports of what America has done, is doing, or proposes to do in the matter of "dumping" iron and steel on our markets. Most of these reports are remarkable for their economy in the matter of truth, but undoubtedly a good deal of American steel has now been sold in England and Wales. The sales of American pig iron, however, have not been very large as yet and neither iron nor steel has yet been sold from your side in this particular district. Nor, although there is talk of German competition in ship plates, have any sales taken place, and such offers as there have been have not been low enough for business. Our Scotch manufacturers still quote £5 12s. 6d. less 5 per cent. but in the north of England the price has been reduced to £5 10s. less 2½ per cent. Steel angles also are about 5s. per ton lower and there is certainly an expectation of lower prices all round.

Meanwhile, as regards labor, a reduction in the north of England is likely to be effected without much trouble though with some grumbling. The shipwrights, boilermakers, platers, riveters, joiners, etc., have all been notified of a reduction of 5 per cent. in piece rates and 1s. to 1s. 6d. per week in time wages to come into operation after the end of this month.

All the big German steamship companies seem to be doing badly this year. The Kosmos Line, trading with the west coast of America, has difficulty in getting home freights; the German-Australian Line has had a bad year owing to the crop failure in Australia; the German East African Line has done a poor freight business, but passenger business has been good; the Levante Line has had a bad year, and it is doubtful whether a dividend can be paid. With heavy passenger and emigrant business the Hamburg-American and the North German Lloyd lines may be able to make good what they have lost in the American freight business, but the outlook is not regarded with confidence.

Ship owners and seafarers of all nations are interested in some of the proceedings of the sanitary conference which has been sitting in Paris for the last three weeks under the presidency of M. Farrere, the French ambassador in Rome. It has at present under consideration a project for the creation of an international sanitary bureau for the collection of information respecting infectious diseases such as plague, cholera and yellow fever, and also for the harmonious working of those sanitary regulations in the east which have so greatly contributed within the last few years to the preservation of public health, as well as to the benefit of trade, by the suppression of the old quarantine system. The proposal is favorably regarded by the great powers concerned, including Great Britain. The international sanitary bureau would have its headquarters in Paris, France being the original promoter of the scheme. The plan now being discussed by the sanitary conference in Paris promises to remove a serious obstacle to the uninterrupted maintenance of friendly international intercourse.

A fifth steamer, the Lady Strathcona, has been launched at Walker-on-Tyne for the Canadian and inland line. This boat is for the ocean section of this service, which works in connection with lake boats plying between the lakes and Montreal. The Lady Strathcona, as soon as she leaves the builders' hands, will be run to Halifax or St. John until the St. Lawrence season opens, after which she will go direct to Montreal. The company contemplates the addition of two more ocean boats next year, of about 7,000 tons capacity, and contracts for these will probably soon be placed.

The winter season between Glasgow and Canada was opened last week when the Donaldson Line steamer Concordia left for St. John, N. B., with coal and general cargo. There was not so much general cargo forward for the vessel as was anticipated, owing to the late sailing of the Allan liner Ontario for Quebec and Montreal, a great quantity of "direct" goods having been consigned by her. The season's trade is, however, expected to be better than in previous years. The Alcides follows this week.

Richmond Pearson Hobson of Merrimac fame has prepared a bill which he has requested Representative Wiley of Alabama to introduce in the house of representatives. It appropriates the modest sum of \$2,750,000,000 for the navy department. Fifty million is made available for the present fiscal year, \$60,000,000 for the next, and so on increasing by \$10,000,000 each year up to 1915 when a lump sum of \$1,500,000,000 is made to carry on the program up to 1925.

## ANNUAL REPORT OF HYDROGRAPHIC OFFICE.

The annual report of Com'dr W. H. H. Southerland, hydrographer of the navy, is very interesting. While he does not specifically recommend to the secretary of the navy that the branch hydrographic offices remain under the jurisdiction of naval officers, it is quite clear that he believes it to be in the interest of the service that naval officers should continue in charge. Concerning lake surveys he says:

"No naval hydrographic surveys on the great lakes have been made during the past year, and as the charts now issued by the United States army engineers and the hydrographic office cover all the coasts of the great lakes excepting a part of the Canadian shore on Lake Superior, it is not probable that the Michigan will be called upon in the future to do anything beyond searching for and developing newly-discovered dangers which may be reported from time to time."

The hydrographic office has in progress a series of charts intended to cover every navigable portion of the globe, excepting the United States coasts, which, when completed, will render available for supply to United States vessels charts for every region that a vessel may be called upon to visit. This work is undertaken with the purpose, first of enabling American vessels to be assured of possessing under all circumstances a chart based upon a combination of the most reliable authorities, and secondly the establishment of a system of government chart supply, thus preventing the cutting off, in time of war, of the means of obtaining an article which is absolutely essential for the safe navigation of naval vessels. The publication of a series of sailing directions, likewise intended to cover the globe, a most important supplement in navigation to the charts, is also in progress and for similar reasons. Com'dr Southerland adds:

"A careful consideration of the objects and work of the hydrographic office, as herein set forth, clearly leads to the conclusion that the publication of hydrographic information in the form of charts, sailing directions and other aids to mariners, and the supply of such to the fleet is a military function which is essential to have performed under the control of a military department. As at present established the hydrographic office is charged, under the direction of the secretary of the navy, with the preparation and supply of this military outfit."

The commander again calls attention to the necessity of having an adequate force of retired officers attached to the hydrographic office whose duties shall pertain solely to the preparation of sailing directions. On this score he says that the rank of authors of fifty-eight volumes of British admiralty sailing directions was as follows: Vice-admirals, two; rear-admirals, two; captains, thirty-four; commanders, eighteen; lieutenants, two. Concerning derelicts the hydrographer says:

"The question of the danger from derelicts is becoming a very grave one to mariners, particularly to those who traverse the transatlantic steamer routes. With the continuous increase of size and speed of our transatlantic liners the necessity of keeping the routes of those vessels clear of all floating dangers is becoming more and more imperative. During one interval of seven years the total number of derelicts reported in the North Atlantic amounted to 1,628, of which 482 had been identified by name. This means an average of nineteen each month, and, since the records of this office show that the average derelict remains afloat about thirty days, it may be said that there are nineteen of these floating dangers in the North Atlantic all the time. The identified ones are easily followed and their tracks plotted on the pilot chart. From 1889 up to the present time the hydrographic office has received reports of 127 collisions with ice, derelicts and wreckage in the North Atlantic alone, and probably many others occurred which were never heard of. The pilot chart shows the approximate position of those reported before going to press, and in many cases the drift of individual derelicts for long periods of time. While this is an aid to the mariner in the nature of a warning, it is not enough to insure his safety."

"The navy department has a certain amount of jurisdiction over wrecks and derelicts on our seaboard outside of the 3-mile limit, and when it is deemed necessary sends vessels out to destroy or tow them in. It has not, however, any special class of vessels fitted for deep-sea work of this kind along the transatlantic routes, and it is to be regretted that no international legislation provides for the destruction of such dangers in the broad ocean, especially as such legislation has been possible for many years. As far back as 1889 the international marine conference adopted a resolution looking to a conference of the maritime powers respecting the removal of derelicts in the North Atlantic. The congress passed a resolution authorizing the president to make an international agreement providing for carrying out this recommendation. The government of Great Britain was communicated with on the subject with the result that a joint committee of the British admiralty and board of trade investigated the matter and came to the conclusion that they were unable to recommend that such an attempt be made. It is thought that if this subject was to be taken up at this time a different conclusion would be reached. The plan is believed to be a feasible one for the North Atlantic steamship lanes, and could be carried out by one properly-equipped vessel on each side. As the matter is becoming of more and more importance to safe navigation each year, and as it is a fact that our coast is the birthplace of the great majority of derelicts in the North Atlantic, it is believed that it would be wise for our government to take the initiative in this matter and to specially detail one properly-equipped vessel to patrol the transatlantic lanes from our coast to the eastern limit of the Georges bank."

While the possibility of serious disaster from collision with derelicts may seem rather remote, the mere fact that such a possibility exists calls for the adoption of the most effective means of prevention. Taking into consideration the fact that during the ten-year period from 1893 to 1902 forty-two collisions with derelicts or parts of derelicts were reported to have occurred in the North Atlantic alone, it is more than reasonable to believe that one season's experience would fully demonstrate the practical usefulness of a patrol of the nature recommended. Since the beginning of this calendar year four collisions with submerged derelicts or wreckage have been reported, one vessel being towed in disabled, one having lost three blades of her propeller, one having lost four blades of her propeller, and the remaining one having sustained damage to her propeller and other slight loss. This office earnestly recommends that the attention of congress be invited to this most important subject."

A large part of the report is given up to detail concerning the work of the branch hydrographic offices.

## SENATOR FRYE'S REPLY TO HERR BALLIN.

In a recent issue of the New York Herald Herr Ballin, director-general of the Hamburg-American Line, declared that there was nothing to be gained by congressional aid to American shipping and hoped that congress would not be led into subsidizing American ships. He spoke of the Cunard subsidy as deplorable. This interview stirred Senator William P. Frye of Maine deeply and he accordingly sent the following answer to it to the Herald:

"I see that Herr Albert Ballin, director-general of the great and wealthy German steamship corporation, the Hamburg-American Co., in a remarkable interview in the Herald, pleads with the American people not to protect and encourage their one unprotected industry—American shipping in the deep-sea trade. This German ship owner, who receives a large share of the \$200,000,000 which the United States pays every year to foreigners for carrying our freights, mails and passengers, objects especially to subsidies to American steamships and speaks of the example set by Great Britain toward the Cunard Line as extraordinary and deplorable. This Cunard subsidy is about \$1,000,000 a year for 17 and 24-knot steamers. It might be imagined that Herr Ballin had never heard of a German imperial subsidy of \$1,330,000 a year for 12 to 14-knot steamers, and yet for a considerable time—he says he has given it up now—his own company shared the benefit of this subvention."

"This instructive fact, with others of equal significance, is set forth in the pages of special consular report XVIII. for the year 1900 by Mr. Frank H. Mason, our consul-general at Berlin. Mr. Mason states that twenty years ago, on the initiative of Prince Bismarck, then chancellor of the German empire, the imperial government bound itself to pay a subsidy of 4,400,000 marks (\$1,047,500) a year for fifteen years to the North German Lloyd Steamship Co. for a line to Australia and the Orient, composed of vessels 'to be built in German yards, of German material and manned throughout by German subjects.' Our consul-general goes on to show how this truly extraordinary subsidy, and the accompanying requirement that the subsidized ships should be built in German yards, so stimulated construction in the empire that both the North German Lloyd and the Hamburg-American companies were enabled to order home ships like the Kaiser Wilhelm der Grosse, Friedrich der Grosse, Konigin Luise, Augusta Victoria, Furst Bismarck, Patricia and Palatia. 'That they did this at all,' Consul-General Mason declares, 'was mainly due to the fact that they were forced into it by an act of legislation.' And this opinion that the celebrated German liners are thus the direct fruit of state aid to German ship yards is confirmed by the specific statement of the report on steamship subsidies submitted to the Reichstag in 1898 that 'all experts assert that without the influence of the government ocean mail service, such a steamer as the Kaiser Wilhelm der Grosse could not have been built.' And this is equally true of Herr Ballin's great Deutschland."

"Consul-General Mason further shows in his report that in 1890 another imperial subsidy of 900,000 marks (\$214,000) was granted for a German steamship line to East Africa, and that in 1898 the Australian and oriental subsidy was renewed for another fifteen year period and increased to 5,590,000 marks (1,330,420) a year, while some ships of the Hamburg-American company were admitted to its benefits. Nor are these generous mail subsidies the only encouragement to German shipping. For many years all materials for German ships have been hauled on government railways, 'at the bare cost of handling and transportation.' This, of course, has been in effect a government bounty to the yards in which Herr Ballin's steamers have been constructed. German merchandise for export by German steamship lines also enjoys preferential rates on these government railways. Says the American consul-general at Berlin, moreover:

"Not only has the German merchant marine been thus liberally and consistently supported by subsidies of money from the public treasury, but it has been encouraged, applauded and honored by the entire influence of the imperial government, which, in a country like this, where royal favor is so potent and eagerly sought for, is an important element of state. The emperor is not only an enthusiastic yachtsman and sailor, but he is, under all circumstances, an ardent and powerful advocate of expansion and improvement of the German fleet and the merchant marine."

"Need any of us wonder why Herr Ballin is so solicitous that no national subsidies, no policy of patriotic favor, should be

applied to the relief of the hard pressed merchant shipping of the United States? If this were done, and if American cargoes were conveyed and if American passengers traveled by American ships, what would become of the Hamburg-American fleet on the North Atlantic? This great German ship owner runs a risk of arousing a costly resentment when he asserts that subsidies have always 'resulted in an inferior condition,' and cites our one American transatlantic line as proof of it. It is untrue and unjust—this attack upon our national company.

"There are those in this country who have not yet forgotten that in 1898, when the swift American liners were being armed and hurried to sea to scout along our coasts and defend our trade, Herr Ballin and his fellow Germans took some of their best ships out of the New York service and sold them to Spain, to 'burn, sink and destroy' the commerce of the American people. One of these German vessels, if I mistake not, formed part of the fleet which Admiral Camara led to Suez in an attempt to strike Admiral Dewey at Manila."

#### SEEN AND HEARD ON THE LOOKOUT.

The gospel of youth is being preached everywhere. In Sappho Alphonse Daudet proclaimed his belief in it, and the want columns of the daily papers testify to the desire of employers to secure the services of young men and women. Recently a few of the so-called soulless corporations also became converted and declared that in the future the fact of an applicant for a position having lingered in this vale of tears more than thirty years would be considered a just cause for refusal of his request. And, now, take a look in ships' forecastles. Whatever flag may appear over their sterns, to the hands before the mast the term youthful can almost invariably be applied. Where go the old sailors? It is, of course, difficult to say what calling seamen turn to when old age makes them undesirable additions to a ship's crew. Having been requested by a Dutch journal to give an account of the manner in which New York city's garbage is removed I made a trip recently on an ash-laden scow. The captain, a veritable ancient mariner, had sailed from boyhood, and as he declared with evident pride "on deep water." In all our conversation there appeared to run through the old fellow's discourse a vein of apology for his fall from a more enviable state. This sense of shame must be attributed to the ocean sailor's prejudice, for apparently, in comparison with the life led by a deep-waterman, the scow commander's mode of existence could be likened to that of a maritime "Sybarite." The pay is better than that of almost any able seaman—\$14 a week. The freight carried is, well—not nice, but he never handles it. The cabin he inhabits in solitary splendor is roomy, clean and well lighted, and a pleasant contrast to the average forecastle of ocean vessels. Towing down the sound we picked up five more scows at the various "dumps," and then observed that these craft are built exactly alike on the dry goods box plan, having to be numbered for identification purposes. For similar reasons the captains might have been numbered, for, strolling from scow to scow while they were being towed on the night in question, I was unable to select the craft originally boarded by trusting to my ability to pick out the captain. While half the world is said to know nothing of how the other half lives, only the few persons who handle a large city's refuse have any idea of the number of still-serviceable articles thrown away by the many. The scows' cabins contained rather creditable pictures, comfortable carpets, and ingenuously-doctored rocking chairs—all rescued from the garbage. Any old sailor who possesses a memory sufficiently retentive to preclude his forgetting that three long and two short blasts of the whistle signals the city tug's approach can pass the examination for master of a scow.

Last January the steamship *St. Louis* left Southampton on what has since proved to be her longest trip. Advertised to reach New York in seven days, it required double that number to end the voyage. As an index of what a short while ago would have been termed "fin de siècle" progress, may be told the intention of one of the steamer's passengers to begin suit for damages. The question may now be asked: Upon what can this up-to-date traveler found his claim? Is it breach of contract or the getting of money under false pretences? Shades of our easy-going ancestors! And let us suppose that this gentleman succeeds in collecting damages from the steamboat company because the *St. Louis* failed to arrive on time. The happening of such an eventuality would certainly establish a dangerous precedent. We are all proud of our rapid transit, both on land and water, but should the speedy steamers or the fast trains be unavoidably delayed reasonable passengers are prepared to grin and bear it. Should this plaintiff win his suit it would then be in order to peruse the flowery and alluring literature of the steamboat companies' circulars, and having selected a victim and engaged a berth, one might bribe the engineer or pray for boisterous weather. It would then be interesting to observe if "graft," of late leading a strenuous life on shore, could acquire sea legs.

She was a large American sailing ship, recently arrived in one of the Atlantic ports from India. While it is nothing unusual for sailors coming from that part of the world to import a few monkeys, the astonishing large number of these animals on the ship in question caused a stir, even among the dock loafers. An authority on monkeys said that of every five that are shipped two die "en passage," and as forty-three simians were counted along this ship's deck your readers may get an idea of the probable

number that embarked in India. What appeared most interesting, however, was not alone that the sailors had captured every one of these monkeys, but the novel and ingenious manner in which the capture had been effected. The scene, I believe, was laid in Rangoon, and one of the actors gave the following description of the performance: In a sound cocoanut one cuts a hole sufficiently large to permit the passage of a marble or a pebble. It must now be understood that no primitive monkey deigns to open a cocoanut before having become assured after a vigorous shaking, that milk will be found within. Any monkey shaking a cocoanut containing a pebble hastens to investigate the cause of the unusual rattling. Inserting a paw—must I say hand—it grasps the pebble. A fist is, however, too bulky to be withdrawn, and the poor monkey, not having the wit to relinquish the pebble, is easily captured. But prospective hunters are hereby cautioned to slowly approach a cocoanut-encumbered monkey, my narrator explaining that at a too-sudden rush by the sailors some monkeys broke their legs. Each monkey caught by this crew was immediately bitten in the ear by its captor. A belief that it hastened the prisoner's taming was the cause of this brutality. Members of the Society for the Prevention of Cruelty to Animals are not plentiful in such places as Rangoon, but, as regards monkeys—the woods are full of them.

#### ANOTHER SHIP BUILDING SENSATION COMING.

Announcement of action to be begun shortly on behalf of the Commonwealth Trust Co., formerly the Trust Company of the Republic, was made this week by President Scarritt of that company. It is intimated that the new action will bring out extraordinary facts in connection with the formation of the United States Ship Building Co. The actions are to be begun at the instance of Messrs. Fish, Crimmins and Bolte, members of the present directorate of the trust company, who were members of the old company, with the primary purpose of protecting their own reputations. The company has decided to go into a thorough investigation of the affair, with the object not only of recouping the company but of showing it to have been victimized by persons in high financial standing. President Scarritt authorized the following statement:

"Mr. Scarritt, the president of the Commonwealth Trust Co. (formerly the Trust Company of the Republic), said that the Trust Company of the Republic, to the extent that it had been silent and quiet under the ship building charges and statements, had changed its position, and intended to take an aggressive position; that this meant that, instead of simply suffering losses and acquiescing in what had been done, it proposed to take an affirmative fighting position, irrespective of whosoever was hit by the statements of fact. He declined to say, however, what suits would be brought or who would be involved. He added that the facts would be set forth, and if they created a coat that fitted to anybody's back, that was the fault of the back, and not of the coat."

It is reported that the revelations will be of an astounding character. Original and letter-press copies of letters and photographs of checks, it is said, will be a part of the complaint. The original of a letter from a financier of high standing, written before the ship building company was organized, to a high officer of the trust company, offering to divide the proceeds of the financing of the affair if he will get the trust company into the deal, and a letter-press copy of the reply, will be embodied in the charges.

#### OUR NEED OF SHIPS.

This problem of the rehabilitation of our almost vanished shipping industry on the high seas is of quite as much importance as is the construction of the isthmian canal. We cannot reap the full benefit of that work unless we develop the merchant marine to proportions commensurate with the proportions of not only the actualities but also the possibilities of our foreign commerce. And we cannot do that without special effort. We have waited too long for our shipping industry to grow of itself. Instead of growing, it has diminished, shriveled. It must be forced. It is the highest time for the congress to act.—*Albany Journal*.

An object lesson of striking import was furnished during the conflict with Spain. Hostilities lasted but 120 days, yet within that period the government purchased or chartered forty foreign vessels. Meanwhile every city on the Atlantic and Gulf coasts was in trepidation over the danger of attack by Spanish warships. Should we be drawn into hostilities with any power possessing a large navy we should be seriously crippled and handicapped without the necessary ships for use as colliers and transports.—*Troy (N. Y.) Times*.

Lumber shipments from Portland, Ore., during the month of October were heavy, a total of 14,349,139 ft. going out by water to foreign and coastwise ports. Of the total shipments, 8,604,139 ft. went foreign, the cargoes being as follows: British bark *Saxon*, 1,342,091 ft.; German steamer *Eva*, 2,526,746 ft.; British steamer *Yeddo*, 2,796,845 ft.; British steamer *Vermont*, 1,934,457 ft.; British steamer *Indrasamha*, 4,000 ft. The *Saxon's* cargo went to Callao; the *Eva's* to Tsingtau, China; the *Yeddo's* to Manila; the *Vermont's* to South Africa, and that on the *Indrasamha* to Hong Kong. Not one American vessel is named in the list.—*Pacific Lumber Trade Journal*.



## SUBSIDIES, HIGH TARIFF, OUR MERCHANT MARINE.

Editor Marine Review: It was expected that Mr. Bates, claiming a monopoly of the shipping question, would have something to say about my letter in the Review of Nov. 5. He prefaces his epistle in the Review of Nov. 19 with some personal remarks which are a failure and which have nothing to do with the subject.

As commissioner of navigation in 1890, Mr. Bates failed to convince congress that bounties and subsidies are the right remedies for the decline of the merchant marine in the foreign trade, and as he says he has twice failed as ship builder, he seems to have failed all the time. In spite of all these misfortunes it must, however, be admitted that Mr. Bates is deserving of praise for having pointed out in his official report to the treasury department, 1890, some of the causes of the decline of our merchant marine in the foreign trade; but his intense hatred of everything foreign or British has prevented him from seeing everything in the right light. For instance:

1. He fails to see that under reciprocity United States shipping had to expect to part with half the percentage of carriage in the foreign trade which it had under the exclusion act when enjoying practically a monopoly of the trade.

2. He fails to see that the war of 1812 and the blockade of all United States ports brought the people near the verge of starvation and made them willing to open ports for foreign shipping to prevent a repetition of the severe lesson.

3. He fails to see that under reciprocity the United States merchant fleet in the foreign trade assumed large proportions, in spite of the unavoidable shrinkage of United States tonnage employed in the domestic-foreign trade, proving conclusively the advantage gained from employment between foreign ports.

4. He fails to see that the enormous increase of American tonnage in the foreign trade was due to the United States being first in building clipper ships outdistancing vessels of the old type.

5. He fails to see that the era of clipper ships was short, because of the British being first in building steamers outdistancing sail vessels.

6. He fails to see that the tendency of increasing the size of vessels, to cheapen transportation, lead to the use of iron and steel as building material for ships, and that foreigners were first in building large vessels.

The United States lagging behind in the use of steam and iron was outstripped by foreigners as a matter of course, in the same way that Germany today has outstripped all other nations with her swift ships in the passenger service. As long as the United States had the swiftest ships she dominated the sea, but when other nations took the lead the United States had to take a back seat, all of which clearly shows that "reciprocal liberty of commerce" has not ruined the United States merchant fleet in the foreign trade, as Mr. Bates in his report of 1890 asserts, but failure to keep up with the times has been its cause. In his report of 1890, page 144, Mr. Bates says: "The disadvantages against which American vessels in the foreign trade have to contend are fourfold—first, liberal postal and naval subsidies and building and sailing bounties paid by chief shipping nations; second, lower wages to mechanics in foreign ship yards, machine shops and dry docks, and lower wages to officers and seamen, and lower cost of maintenance on ship board; third, hostile discrimination of British Lloyds in respect to inspection and classification and of English underwriters in regard to the insurance of cargoes in American-built ships, compelling vessels under our flag to wait longest for charters and to receive always the lowest rates of freight; fourth, competition of the severest kind with all the shipping of the world, in consequence of the free shipping policy of our own government since 1828, and no attention given by congress nor any action taken to secure equal footing and fair play for our shipping under the unequal and destructive competition which it has invited, and which has subordinated our shipping service to the will and caprice of our rivals and enemies, driven our people and our flag from the high seas and crippled our right arm of defense."

Thereupon Mr. Bates goes to work and recommends to congress a bounty bill, and a postal service or subsidy bill. Now thirteen years later in his letter above referred to he says: "The subsidy cog for American shipping is no better than the tariff cry in character," and "the dislike of the tariff is mere prejudice," although he fully well knows the tariff is the cause of the difference with foreigners in wages and in the cost of maintenance on shore as well as on board ship; which difference he repeatedly has stated to be one of the four disadvantages against which American vessels have to contend. When this point was discussed in the senate, Mr. Frye from Maine said: "As a matter of fact, of course, it is our tariff that has caused this difference. There is no doubt about that. Our tariff has increased the wages of laboring men in our protected industries in this country, and you cannot increase the wages of one class without increasing those of the other." (See page 205 of Mr. Bates' report.)

Lower wages by removing the tariff do not necessarily imply cheap or trashy ships and a lower level for working men. It is not the amount of wages a person gets but how much he or she can buy for it that determines his or her status. It is ridiculous to claim protection by tariff for our industries in view of the fact that American workmen are doing twice as much work in the same time as foreigners and therefore need not be afraid of competition, for everybody knows that a greenhorn cannot compete with

any of our laborers. Our workmen do not need protection, which is only a blind to enrich monopolists.

What Ricardo and Mr. Bates cannot see is that dispatch is a principal factor in the carrying trade. As long as Americans had the swiftest ships they had the advantage over the British, and the latter in the same way had the advantage over the Russians. It is of no use for Italians and Spaniards to buy British ships to outstrip the English. On the other hand, the Germans, building their own ships, successfully compete with the British, because of the swiftness of their ships and good seamanship.

As a relief, Mr. Bates mentions taking off the tariff in 1870 from ship material, but he forgets to state that an internal revenue tax was added to the cost of vessels, which certainly was no relief.

In view of the fact that all other maritime nations have held their own in foreign carriage against British competition, it is evident that something must be rotten in the United States with its superior workmen and mechanics, and it is easy to perceive that the tariff is the cause of such rotteness.

In repudiating his former views, and advocating now heroic measures of discriminating duties and exclusion of foreign shipping, Mr. Bates may do well to consider the blockade from 1812 to 1815, and its consequences, before going any further in that direction.

JOHN MAURICE,

Civil Engineer and Nautical Expert.

Chicago, Nov. 29, 1903.

## SHIP YARD NOTES.

The Kelley-Spear Co., Bath, Me., a few days ago launched the four-masted wooden schooner *Salisbury*.

M. B. McDonald & Sons, Mystic, Conn., launched last week the four-masted wooden schooner *Quinebaug* for Capt. C. A. Davis of Somerset, Mass. She is 166 ft. long, 35 ft. beam and 13 ft. draught.

The Maryland Steel Co., Sparrow's Point, Md., launched last week the steel tug *Conestoga* for the Philadelphia & Reading Railway Co., to be used in the coastwise towing trade. Her dimensions are: Length, 163 ft. 6 in.; beam, 29 ft.; depth 18 ft. She is equipped with triple-expansion engines with cylinders 18, 28 and 45 in. in diameter by 30 in. stroke, supplied with steam from two Scotch boilers 12 ft. in diameter and 12 ft. 6 in. long.

On Saturday last the Burlee Ship Building & Dry Dock Co., Port Richmond, S. I., launched the new ferryboat *Arlington* for the Erie railroad. The *Arlington* is constructed of steel throughout. She is 224 ft. over all, 43.6 ft. beam and 17.6 ft. deep. She will be fitted with two compound engines 18 and 28 by 38 in., supplied with steam from two Scotch boilers and driving a single screw. She is a double-decker and will be finished in mahogany.

The two steel lightships being constructed for the Dominion government are nearing completion at the Polson Iron Works, Toronto. The first of these vessels, *Lurcher No. 14*, intended for the Lurcher shoals off the Nova Scotia coast in the Bay of Fundy, will be ready for inspection next week. The second vessel is not so far advanced and probably will not be finished until next spring. The vessels have a large amount of freeboard and are sheered very high in the bows so as to keep them dry when pitching into a head sea. Their general dimensions are: Length over all, 124 ft.; beam, 28 ft.; depth from top of keel to spar deck, 21 ft. 6 in.; draught, fully loaded, 11 ft. 6 in. Each vessel is fitted with one high-pressure surface-condensing vertical marine engine with cylinder of 23 in. diameter and 22 in. stroke, supplied with steam from two navy type boilers, allowed 140 lbs. pressure.

## GERMAN NAVAL ESTIMATES.

The North German Gazette referring to the budget bill for 1904 says that naval estimates for permanent expenditure call for 99,827,620 marks (\$24,956,905), an increase of 6,558,366 marks (\$1,639,591). This item includes 25,971,797 marks (\$6,492,949) for maintenance, an increase of 2,020,176 marks (\$505,044). The regular expenditure is estimated at 107,536,370 marks (\$26,884,092), an increase of 1,904,500 marks (\$476,125). This includes the first installments for the construction of two battleships, one large cruiser, three small cruisers, and one torpedo boat. The extraordinary expenditure for the navy is estimated at 50,685,000 marks (\$12,671,250), an increase of 3,510,000 marks (\$877,500). The total estimated expenditure amounts to \$64,512,247.

A note from Delaunay Belleville & Co., manufacturers of the well-known French water-tube boiler, says that trials of the armored cruiser *Admiral Aube* (20,000 H. P.) justifies the confidence they have had in the Belleville boiler of the economizer kind from a fuel economy standpoint. On a 24-hours' trial of this cruiser at 10,850 H. P. the consumption of fuel per horse power per hour was only 558 grammes. On a 6-hours' trial at 14,519 H. P. 76 kilos of fuel per square meter of grate per hour were burned and the consumption was only 580 grammes. The *Desaix*, another French cruiser, was recently subjected to a full-power 3-hours' trial. The vessel developed 17,715 H. P., which was 615 H. P. more than was expected, with speed of 20.7 knots. The consumption of fuel was 8.8 grammes to a combustion of 1.48 kilos per square meter of grate per hour, instead of 160 kilos as anticipated.



### CONSIDERABLE SHIP YARD WORK FOR THE WINTER.

Notwithstanding the unfavorable outlook for ship building on the lakes, talked of for some time past, the next two or three weeks will probably see orders enough placed to make quite a favorable showing in the aggregate. Gen. Mngr. James Wallace and other officials of the American Ship Building Co. are now figuring on several orders that may be closed even within the next few days, and it is quite probable that a couple of contracts have been secured about which nothing is being said for the present. It is also understood that the Great Lakes Engineering Works of Detroit has booked an order or two of which no announcement is made on account of the delays they have been subjected to in getting their plant fully under way by contractors who are doing the dredge work and installing ship yard cranes. Altogether the lake yards will not be idle by any means. Very probably it will be found when a summary is made about the first of the year that with work carried over by the American Ship Building Co. the total value of new orders will be at least half what they have been on Jan. 1 of the past two or three years of great activity. Of course the new freighters as they are enlarged from year to year are higher in price, and each order, therefore, makes a larger addition to the total value of new work. The latest Wolvin steamer, for instance (the 560-footer), is to cost \$470,000, as against \$200,000 to \$225,000 paid two years ago for freighters of the 4,500 to 5,000-ton kind. The keel for the big Wolvin boat was laid at Lorain Monday. She is to be delivered about April 1. One important announcement of the past week is an order from G. A. Tomlinson of Duluth to Mr. J. C. Wallace, vice-president and general manager of the American Ship Building Co. for a freighter of 494 ft. length over all, 52 ft. beam and 29 ft. deep. She will have twenty-eight hatches to facilitate the handling of cargo. She is to cost about \$350,000 and is to be built at Lorain on a berth adjoining the Wolvin steamer.

In order to protect its fish supply the Dominion government has given an order to the Polson Iron Works, Toronto, for a cruiser for service on Lake Erie. She is to have a speed superior to any tug or fishing vessel now on the lakes. The specifications are not yet fully completed.

### LAKE FREIGHT MATTERS.

The lake season of navigation is winding up rather tame, as the demand for grain carriers has hardly equalled the expectations of a couple of weeks ago and freights are not attractive. Since Monday grain cargo insurance rates have been more than double what they are ordinarily, and with the expiration of all insurance policies on Saturday lake shipping may be said to be at an end for the season. The insurance companies will probably be less disposed than ever this year to grant extensions. Meanwhile considerable hustling is being done to get out by Saturday. Coal rates have advanced to 75 cents for both Lake Superior and Lake Michigan ports. There is considerable coal on dock at Sandusky to go forward and a scene of great activity is presented there. Ice has formed in the bay so that tugs have had to be employed to smash it. The last vessels to take ore cargoes will be loaded on Friday. The total shipments of ore by lake will probably not reach 24,000,000 tons. It is understood that the Steel Corporation calculates that its supply at furnaces and on Lake Erie docks is sufficient to last it until next August. Of course it brought down last year 25 per cent. more ore than it needed, which is to be added to this year's reserve.

### HEAVIEST LOSS OF THE LAKES THIS SEASON.

The steel steamer J. T. Hutchinson, on the rocks near Eagle River, Keweenaw section of Lake Superior, with a cargo of 187,000 bu. of flax seed, will probably cost the insurance companies full \$400,000, as there is little hope of her release. She was abandoned to the underwriters immediately upon receipt of the news of the accident on Monday last, as the captain reported her cargo hold then half full of water, with the vessel rising in the middle, where she was resting, on account of a depth of 30 ft. of water under her at both ends. The Hutchinson stranded in a snow storm. Her captain was probably pushing her along, as many others have done, in bad as well as good weather, down Lake Superior for the Sault on the regular course close to Keweenaw point. The hull insurance is in companies represented by Smith, Davis & Co. of Buffalo. The cargo, worth about \$1 a bushel, is also fully insured. It was shipped by the National Lead Co. The Hutchinson is a modern 5,000-ton freighter. She was built by the American Ship Building Co., owned by Chas. L. Hutchinson and others of Cleveland, and was in her third season. She had been a very successful vessel. The cargo that is lost with her was her thirty-first one for this season.

### ABOUT PIGEON BAY.

In asking congress on behalf of the vessel interests of the lakes for a light and fog signal on Pigeon point, Lake Superior, at the mouth to Pigeon river, so as to make Pigeon bay available as a harbor of refuge, Capt. Geo. P. McKay of Cleveland was recently quoted as saying that Pigeon bay is now a large natural harbor with good water and good holding ground. A correspondent corrects Capt. McKay in this regard. He directs attention to the following "Notice to mariners" issued Oct. 10 last by the Canadian government:

"The exact positions of two uncharted rocks in the south arm of Pigeon bay have been determined by Mr. W. J. Stewart of the Canadian hydrographic survey, as follows: Laura Grace rock, with 8 ft. of water on it at present, is very small and lies N. 56° 45' E. 3,400 ft. from the south entrance point to Pigeon river, and exactly in line between the northeast bunch of mooring piles off the river and the north shore of Pigeon point, distant 1,500 ft. from the former. Acadia rock, with 7 ft. least water over it, is also small and lies about 1,400 ft. S. 89° 15' E. from Laura Grace rock. Both rocks are south of the trend of the islands in the mouth of the south arm and are inside the 10-fathom line. Outside these rocks the water is deep. Until a careful resurvey of this bay can be made mariners should use it with great caution, as the rocks render the anchorage space dangerous. The holding ground is not good. A vessel requiring shelter in this locality will find it in Little Trout bay in less than 10 fathoms, good stiff mud."

### EARLY REMOVAL OF LIGHTS, BUOYS, ETC.

Again this year the lake vessel interests are very much disturbed by the removal of light-ships, buoys, etc., before one-third of the fleet has gone out of commission. Of course the claim of the lighthouse officials is that they must avoid the risk of loss of these aids to navigation through being carried away by ice. They certainly removed the channel marks earlier than was necessary this season, especially those on the Detroit river, but it is the old story over again of little satisfaction in trying to reason along business lines with government officials and especially those that have to do with rivers and harbors. After considerable effort as to the Detroit river situation, Lake Carriers' officials succeeded in making an arrangement whereby the Bar point lightship will remain on its station until Dec. 15. The Lime-Kiln crossing will be marked by two floats in the positions of the north and south lightships, and three striped bar buoys will mark Ballard's reef. The Lake Carriers will have a tug patrol this stretch of the river and watch that the markers are not displaced by the running ice.

### DULUTH GRAIN MATTERS—IRON ORE PROSPECTS.

Duluth, Dec. 2.—Shipments of flax from the head of the lakes for last week were reported at 1,831,000 bu. There was in addition 800,000 bu. not reported at the close of the week. This week about 1,000,000 bu. is to go forward, leaving about 3,000,000 bu., including new receipts, here for the commencement of winter. Shipments of wheat for the week were 1,315,000 bu. and will be still more this week. Shippers and exporters state that the head of the lakes will go into the winter with not to exceed 650,000 bu. wheat in store, an infinitesimal quantity. This week the reduction in stocks was 674,000 bu. In the same week last year they increased 1,230,000 bu. Package freight ships will be moving from here all this week, perhaps longer. They are cleaning up flour accumulations, as well as copper, salmon and shingles, very rapidly and little of either is coming this way. Local flour mills will be bare of stock after the last boat leaves. The demand for grain products has been very sharp of late and would have been much better had there been stocks with which to supply it.

The Consumers' Ore Co. (M. A. Hanna & Co.), which is opening a mine on section 21, township 58, range 19, is now down 250 ft., with the main shaft in ore, and will rest at 270 ft., where the first level will be opened. This mine will be a considerable producer the coming year. It is a state lease, paying 25 cents a ton to the public school fund. The same company owns another state lease, the south half of section 11, same township, and is clearing the ground and preparing to open a mine there also. This is a small ore body. This is to be called the Yates mine, and that on 21 is the Frant. The company has two other state leases that contain ore and that will be opened later.

Drills have been taken in north from Virginia to a point in township 62, range 19, 24 miles north of the Mesabi range, where it is claimed there are excellent indications of iron. Work will be carried on all winter. Ore has been known to exist thereabouts for many years, but of its value there is much doubt.

The 1890 reports of the state geological survey reported indications in that district and attention has been attracted that way for some time. For the past two or three years more or less work has been carried on in that district, chiefly by the Great Northern railway, but it is not supposed that results have been satisfactory.

MR. WOLVIN AND THE STEEL CORPORATION.

Nothing definite can be said of the rumor that Mr. A. B. Wolvin is to give up with the close of the present season of navigation the management of the large fleet of Steel Corporation vessels operated on the lakes by a subsidiary organization known as the Pittsburgh Steamship Co. The rumor is not one of the past few days, as it was started fully a month ago from Duluth, but no statement of any kind could be had from either Mr. Wolvin or the higher Steel Corporation officials. Very probably Mr. Wolvin's resignation is contemplated, but all that has been said about his successor is simply newspaper guesswork, based on the fact that the men whose names have been mentioned seem qualified for the position.

CHICAGO GRAIN FREIGHTS.

Chicago, Dec. 2.—With the advance in cargo insurance rates on the first of the month grain freights took a weak turn and have settled nominally at 134 cents Buffalo corn. There will probably be some movement up to the end of the week, freights ranging from 134 to 2 cents corn, but the unusual scarcity of suitably-graded wheat and corn, despite very favorable crop reports and indications of an active country movement, rather hold things at a standstill, the vessels for most part turning to winter berths.

Of the shipments noted below for this week there was moved of wheat all rail some 175,000 bu., corn 145,000 bu., oats 793,000 bu., rye and barley 115,000 bu.; to Buffalo and other American points, via lake, wheat 325,000 bu., corn 775,000 bu., and oats 48,000 bu.; and to Canadian points, via lake, wheat 40,000 bu. and corn 270,000 bu. The usual statement as to lake and rail shipments follows:

	This week.	Last week.	Same week last year.
Wheat, bu.....	540,670	583,800	805,056
Corn, bu.....	1,184,362	1,812,763	892,881
Oats, bu.....	840,579	1,027,342	1,388,799
Rye, bu.....	11,798	12,998	91,590
Total, bu.....	2,577,418	3,436,993	3,178,326
Since Jan. 1, 1903.			Same time last year.
Wheat, bu.....	21,986,657		29,308,655
Corn, bu.....	86,976,682		42,515,532
Oats, bu.....	59,938,577		52,532,050
Rye, bu.....	2,739,225		2,704,838
Total, bu.....	171,641,141		126,061,673

Stocks of grain in public and private elevators are thus reported:

	Week just closed.	Last week.	Same week last year.
Wheat, bu.....	5,706,000	5,847,000	11,334,000
Corn, bu.....	3,176,000	3,255,000	1,080,000
Oats, bu.....	3,125,000	3,222,000	3,428,000
Rye, bu.....	373,000	360,000	360,000
Total, bu.....	12,410,000	12,684,000	16,211,000

TEN DREDGES FOR THE GOVERNMENT.

From the government having undertaken the building of dredges, to be operated by the army engineers, it is not surprising that the dredging interests of the country think the time has arrived when they should appeal to congress for protection for their business. Ten suction dredges are now being built for the government. Two of them are for the great lakes, two for New York harbor, two for the Mississippi river, two for Charleston, one for Galveston and one for Savannah. Five of the dredges are being constructed by the Maryland Steel Co., two by the Jas. Reilly Repair & Supply Co., and one each by the W. R. Trigg Co., the Petersburg Iron Works Co. and the New York Ship Building Co.

These dredges are the largest in capacity ever built and are designed in each case for the special work which they will have to do. They are self-propelling—do not depend upon the assistance of tugboats or other craft to move them around from point to point. Some of them are fitted with immense bins, in which the dredged material is deposited and, when full, the vessel propels herself out to deep water, dumps the sand or mud and steams back to repeat the operation. Others are arranged for depositing the dredged material into large scows fastened alongside the vessel. Their operation is very interesting. A long flexible tube, 12 to 15 in. in diameter, drops down from the side of the vessel 20 to 30 ft. or more to the bottom of the river or harbor upon which the dredging operation is being performed. The upper end of this tube is connected to an immense rotative centrifugal pump revolving at several hundred revolutions per minute

and capable of handling many hundreds of tons of water per hour. The lower end of the tube is manipulated from the vessel against the sand bars and mud banks, and as the water is sucked upwards by the centrifugal pumps a very large proportion of sand and mud goes with it. The centrifugal pumps discharge this water with its suspended material into the tanks on board the vessel or into scows, where the heavy matter quickly settles to the bottom, the water flowing back into the sea.

The mechanical equipment of the dredges for salt-water service will include surface-condenser outfits with Blake air pumps, feed pumps, fire pumps, etc. The dredges for the great lakes are provided with very large Blake cross-compound, double-acting, air pumps and jet condensers with the usual complement of Blake vertical duplex feed pumps, fire pumps, etc. The air pumps are of a very novel arrangement, inasmuch as it is possible by the manipulation of valves and cocks provided for the purpose to cut each pump in half and run one side entirely independent of the other side. This practically provides a spare pump in each installation without the necessity of being overweighted with two duplicate machines, and at the same time secures the advantages of compound steam cylinders.

SHIP'S BELL PRESENTED TO CRUISER CLEVELAND.

On Saturday last a committee from the Cleveland Chamber of Commerce presented to the cruiser Cleveland, stationed at Portsmouth, N. H., a ship's bell, the gift of the city. The committee which presented it consisted of Mr. W. G. Mather, chairman of the delegation; Col. J. J. Sullivan, president of the chamber; F. A. Scott, secretary of the chamber; W. B. Cowles, F. H. Glidden and E. B. Meade. The delegation was received by Commandant Caspar Goodrich of the navy yard and Capt. McKenzie and escorted to the ship where they were met by Com'dr James K. Cogswell. Brief speeches were made by Mr. Mather and Col. Sullivan and replied to by Com'dr Cogswell. The bell was then unveiled by Miss Bianca Cogswell, the daughter of Com'dr Cogswell. The bell is 30 in. in height and represents in bas relief Commodore Perry receiving the sword of Commodore Barclay of the British navy. On another side is a representation of Perry crossing from the Lawrence to the Niagara with the flag across his arm, and next to the figure are several reproductions of the winged victory. Around the lower edge are the words "Presented by the City of Cleveland."

The steamer Gladstone, which was sunk at Bar point in collision with the steamer Sacramento, is now at Detroit. Her cargo of barley and oats, or what was left of it, was sold to the Toledo Salvage Co. for \$2,700. The Gladstone and the Sacramento met at the turn up the river at Bar point, the Sacramento bound up and the Gladstone bound down. It is thought that in turning, with the channel marks removed, the Sacramento went too close to the down-bound vessel and in the shallow water could not straighten up as readily as was expected. However this may be, Capt. Davidson, owner of the Sacramento, is evidently expecting a law suit, as he has filed a petition in the United States court at Milwaukee to limit the liability of the Sacramento.

It is generally believed in New York that interests opposed to canal improvement will do all in their power to delay or prevent entirely if possible the enlargement of the canals as authorized by vote of the people at the last state election. Still State Engineer Bond is quoted as saying that he will at the earliest possible moment advertise for bids for the enlargement of the Erie canal. He believes that construction should begin simultaneously at five points—Cohoes, Little Falls, Newark, Rochester and Lockport. If the bids for this work are within the estimates it will show that the entire work can be done for the sum authorized. Five years is set as the limit for completion of the work, but it can probably be accomplished in less time.

Since the lightship was removed from Simmons' reef near the west entrance to the Straits of Mackinaw several vessels have run foul of it. The most serious accident was that of the steamer John Craig. Last week two more ran upon it, the Commodore of the Western Transit Line and the Cormorant of the Hines fleet. Four hundred tons of flour, feed and brand had to be thrown overboard from the Commodore before she freed herself. The Cormorant also was later released without great damage. An effort will be made to have a new lightship placed on this shoal next season.

The American Society of Mechanical Engineers at its annual meeting at New York this week elected the following officers: President, Ambrose Swasey of Cleveland, O.; vice presidents, O. S. Jacobs, Hoboken, N. J.; M. L. Helman of St. Louis, Mo.; A. Matrice, Pittsburg, Pa.; treasurer, William H. Wiley, Orange, N. J.; secretary, Frederick R. Hutton, Columbia university; members of council, George J. Rockwood, Worcester, Mass.; John W. Lieb of New York, and W. J. Keep of Detroit, Mich.

The Erie Ship Building Co. of Buffalo was incorporated this week. The list of officers include James McDougall, George A. Boland and Edward M. Dutnie.

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### CONCERNING THAT LACKAWANNA PLANT.

W. W. Scranton of Scranton, Pa., who was for many years general manager of the old works of the Lackawanna Iron & Steel Co., and who erected and operated the works of the Scranton Steel Co., retiring when the merger of the two companies took place, has written to the Scranton Times the following interesting letter concerning the stories of trouble at the Lackawanna plant, Buffalo:

"I had lately heard so many stories of trouble with foundations, engines, machinery and buildings settling, ore bank sinking, etc., that, having for my means, considerable stock in the company, I thought I would go see for myself. I accordingly spent a week recently inspecting the plant. First, let me say that, as regards any trouble with foundations of engines, machinery or buildings, I could find no sign of any settling, nor did any one show me any. What may develop hereafter, of course, I cannot say, but it will be time to cross that bridge when reached. These stories seem to have been told with a purpose. A small part of the open air floor of the ore dump did sink, but as this sinking did not disturb either the furnaces on one side or the concrete bank of the great canal on the other, it in no way affects the working capacity of the plant. As is well known, the works are located on land which appears to be silt and stuff washed in from Lake Erie, so that all foundations have to be based on piling driven from 50 to 75 ft. down to hard pan or rock. Of course, this has been enormously expensive, but is compensated by the advantage of the location. Practically all this piling should be considered as part of the cost of the land.

"The scheme of the works is to roll the rails from the initial heat of the blast furnaces, with the new and bold idea, to America at least, of using also as much of the waste gases of the furnaces, hitherto largely thrown away, for direct power in gas engines, running dynamos furnishing electricity for all sorts of purposes around the works, for which steam has ordinarily been used. These uses are innumerable, and will readily occur to any one acquainted with a plant of this nature. Only a bold man, with the full courage of his calculations, would dare to be the first to adopt such an innovation, and for this Mr. Wehrum deserves great credit. Whatever doubts may have been originally felt by any have been triumphantly answered by 8,000 H. P. of gas engines in beautiful operation, all fed by waste gas from only the two smaller blast furnaces yet running. When the four large furnaces are finished and started there will be fully 30,000 more horse power available. It hardly requires an engineering education to see the amount of money thus saved. The plant has the usual foundry, machine and other shops incidental to such works, all well planned, commodious, and their machinery also run by electricity furnished as stated above. Electric traveling cranes are everywhere and command everything, and there are labor saving arrangements of all kinds at all points.

"The Bessemer and rail mill were running. I have seen about all the principal Bessemer plants in the world, but for beauty and simplicity of arrangement, for conveniences for rapid running, this one certainly is a surpassing model. With four 10-ton converters, blowing heats in less than seven minutes, with blowing power to blow doubles—that is to say, two heats at a time—the man who can't stimulate his men to drive that Bessemer plant up to a steady minimum of 20,000 tons of ingots a week, or over 1,000,000 tons a year, should not call himself a manager. Thus far, no metal direct from the furnaces has been used, but only cold pig melted in the cupolas, which are merely meant to be subsidiary to the blast furnaces. I presume they will begin taking metal direct from the furnaces just as soon as the various petty causes of delay incidental in first starting such a plant are eliminated so as to get the men accustomed to every economy for which the works are designed. But, of course, like the gas engines, this also requires a little courage. As the Bessemer is designed to furnish steel not only for the present large rail mill but also for a second mill, not yet erected, for the rolling of small rails, billets and various shapes up to 12 in., we are not likely to see the Bessemer show what it is really capable of till mill No. 2 is also running.

"Without going into details, I may say that the rail mill is unique, its machinery and engines are of the most massive type, reducing from a 20-in. ingot to rail in fifteen passes, and also giving the rail the much desired and invaluable cold finish, which makes a long-wearing rail. While I was there the boys were rolling four and sometimes five ingots at a time, equivalent to twenty 100-lb. rails, simultaneously, and the mill ought to be able, as soon as the men get used to things, to turn out 10,000 to 12,000 tons of rails weekly, with ease. Indeed, much more would not surprise me. Of course, just at starting, there are innumerable and irritating petty causes of delay, which patience and practice will soon do away with. Such is the capacity of the works in their present half finished state. But it must be remembered that the coke plant, with its arrangements for saving its by-product of ammonia; the four immense blast furnaces, 100 ft. high; the great open-hearth plant and great structural and plate mills, as well as No. 2 rail mill, are not yet built, and cannot possibly be completed for a very considerable time yet. When done, the plant will have an easy capacity of 1,200,000 tons of finished product per annum.

"The general plan of the works is evidently the result of the most careful and painstaking calculations, and is symmetrical, complete and admirable. In my judgment it is a great and noble design, and Mr. Wehrum is entitled to immense credit. He is a really great mechanical engineer, and I think it unfortunate

that the company has lost his services before his construction plans have been fully carried out. I heard rumors of changes to be made in his plans. If correct, I am satisfied it will prove matter for ultimate regret. The plant has as good a location as any in the United States for the collection of its raw material and the distribution of its product. All sorts of rumors are afloat that it will either be absorbed by or leased to the United States Steel Corporation. As it has the advantage in its fixed charges of fully \$5 per ton over the Steel Corporation (which is a fortune in itself), and, with its lower phosphorus and cold finish, can make a rail of better quality, I cannot believe that any such folly as giving up the company's independent position is seriously contemplated. If any steel company in the country can make money the Lackawanna Steel Co. can when Mr. Wehrum's plans are carried out. If they do not then make money to satisfy the most sanguine expectations, it will only be because the business is handled by incompetents at one end or the other, New York or Buffalo, or else deliberately mismanaged for a purpose."

### AROUND THE GREAT LAKES.

General repairs to the steamer Nyanza, costing \$18,000, will be made by the Ship Owners' Dry Dock Co., Chicago.

One of the Wolvin St. Lawrence steamers, the Albert M. Marshall, took a cargo of 1,400,000 ft. of lumber into Buffalo a few days ago.

Steamboat service between Detroit and Cleveland ended for the season on Tuesday when both the big side-wheel steamers of the Detroit & Cleveland Line went to Detroit to be tied up.

Coal receipts by lake at Milwaukee this season have exceeded those of last year by over 1,000,000 tons. In November they exceeded 300,000 tons, making the season's total over 2,250,000 tons.

Capt. S. W. Gould, who has conducted a navigation school at 265 Marcy avenue, Cleveland, and who has been successful in helping many young men to licenses, has opened his school for the coming winter.

The steamer Imperial, belonging to the Standard Oil Co., was locked through the Welland canal forty times this season. This is the record for a single steamer. She carries oil from Lake Erie to Montreal.

A Port Arthur dispatch talks of iron ore docks to be built at that port by McKenzie & Mann, railroad contractors, but nobody has as yet heard of any ore mines of the producing kind that would be shipping through Port Arthur.

With the aid of the tug Castle a fleet of lumber carriers, ice bound, were enabled to force their way into Bay City this week. The fleet was one of the largest of the season, having on board 2,500,000 ft. from Duluth and Georgian bay ports.

A big repair job has fallen to the West Superior yard of the American Ship Building Co. on account of the recent stranding of the steel steamer Wilbert L. Smith at the Lime-Kilns. The Smith will spend about three weeks in dock undergoing bottom repairs.

Manager French of the Union Transit Co., Buffalo, has abandoned to the underwriters the wooden package freight steamer Portage, which suffered heavy damage in a storm near Cleveland several days ago and which was gotten into port barely in time to avoid sinking.

The tug C. F. Dunbar, owned by the Great Lakes Towing Co., has been sold to Daley & Harman, dredging contractors. It is said that she will be taken to Boston. The small wooden tug De Graft has also been disposed of. She will be taken to Toronto by her new owners.

The steamer Newaygo, which stranded in Georgian bay, near Tobermory, was a few days ago abandoned as a total loss. The Newaygo was a good wooden vessel, and in the hope that he may be able to do more than the wreckers who gave her up, James Reid has gone to look her over.

The barge Ogarita, in tow of the steamer Zillah, hit the submerged crib near the mouth of Cleveland harbor last week and punched a hole in her starboard bow 18 in. wide and 6 ft. long. She was towed into shallow water by the tug Frank W., after which a patch was placed over the hole.

Wreckers have abandoned all attempts to save the steamer S. C. Baldwin, sunk off Long Tail point last week. The divers report that the vessel is nearly broken in two. The Baldwin lies in 30 ft. of water. Her cargo of lumber is intact and an endeavor will probably be made in the spring to recover it.

Work has been started on the cofferdam to be used in widening the government ship canal above the locks at Sault Ste. Marie. It will take all winter to complete the dam. When the improvement is finished it will do away with the crowding of ships above the locks and with a bad current that is often encountered under present conditions.

Maj. J. G. Warren, engineer in charge of the ninth light-house district, has given notice that the North point lighthouse at Milwaukee would be abandoned by the government on Dec. 31. It is stated that the work of building the first lighthouse on this site, over fifty years ago, was superintended by Jefferson Davis, at that time a government engineer and later president of the southern confederacy.

At Waukegan, the new port near Chicago, approximately 200,000 tons of coal was received in the season just closed, 120,000 tons being anthracite. The bituminous trade is entirely new, having developed since the opening of a new dock last spring. Many of the cargoes exceeded 4,000 tons. The record cargoes



were 6,300 tons of bituminous on the Etruria and 5,200 tons of anthracite on the Leonard.

Maj. W. H. Bixby, government engineer, has abandoned the Glidden wreck in St. Clair flats ship canal and has decided that the plan to raise it by means of pontoons is impractical. The stern section now lies diagonally across the canal. The government engineer is allowing boats to run both ways through the canal. The lights having been taken away, no one will, of course, attempt to run the channel at night.

Misfortune has followed the Chesebrough steamer Kanawha (steel) very closely of late. At Buffalo a big job of bottom repairs, due to an accident at Port Colborne which prevented the vessel from going to the coast, was completed last week and she was loaded with coal for Chicago. She got as far as Bar point when she was again on the bottom. Fortunately she was not long detained at Bar point and the bottom is of sand.

The Western Transit Co. of Buffalo and John Fisher, master of the propeller Mohawk, have libeled the propeller B. Lyman Smith for \$10,000. On Nov. 11 the Western liner Mohawk picked up the Smith disabled by broken machinery in Lake Superior. The Mohawk towed the Smith to Washburn and thereby lost eighteen hours' time. Of course the salvage sought from the Smith is much greater than the value of the Mohawk's time.

Charles Y. Dixon, assistant United States engineer, who has been in charge of dredging operations in the vicinity of Amherstburg and the Lime-Kilns crossing, read a paper before the Detroit Engineering Society last week upon "The Improvement of the Detroit River." Mr. Dixon is of the opinion that it will shortly be found necessary to construct an all-American channel on the western side of the river. He says that when the present channel was started in 1874 the Canadian side was chosen because the natural advantages made it cheaper. Up to the present time the United States government has spent \$2,750,000 on the works to which he refers. The proposed new channel would be west of Grosse Isle.

James Kennedy, freight contractor and grain handler, died Monday night at Buffalo of heart trouble. He had been in ill health for a year or more, but not acutely so until within a month when he was compelled to abandon work altogether. Probably no man on the great lakes was better known than James Kennedy. He was born in County Clare, Ireland, fifty-nine years ago, coming to this country in 1862 with his mother and brothers. For a time he was a member of the fire department. Then, perceiving the advantages of grain handling, he gradually gathered into his hands all the grain of the port of Buffalo. In 1895, 1896 and 1897 he handled all the grain for the Lake Carriers' Association. He was also in the package freight business, handling all the freight for the Anchor Line since 1880. He leaves a widow and six children.

#### CANADIAN SHIPPING NOTES.

Capt. Thomas Donnelly has just returned to Kingston after an absence of over three months on inspection and survey work in different parts of the lakes. He spent some weeks at Superior, Wis., attending to repairs on the steamers Turret Chief and J. H. Plummer; appraised damages by fire on the steamer Reliance at Midland, Ont., and attended the wreck of the steamer Advance on behalf of the owners of that vessel, besides several smaller jobs, which took considerable time. Capt. Donnelly says there are a great many small losses on steamers that have not yet been reported to the underwriters, and which will bring up the total of losses on hulls to a considerable extent. The steamer Advance will be surveyed at Collingwood by R. Parry-Jones, J. V. Tuttle and Capt. Donnelly. The Advance can not be docked as yet, as the bilge blocks have not been placed in the Collingwood dry dock.

The Steamship Senlac Co., Ltd., has been incorporated under the Dominion companies' act, with a capital of \$100,000, to acquire the steamer Senlac, recently built at St. John, N. B., to purchase other vessels and to carry on a general navigation business. The head offices are at Rothesay, N. B., R. Thomson and J. H. Thomson being the principal promoters. The Senlac is to be run on a route between St. John and Halifax.

The close of traffic on the canals has come rather suddenly and a good many vessels have been caught. Three of the Canada Atlantic Transit Co.'s grain barges were caught on the Lachine canal, and at other points vessels are held. Special efforts had to be made to get the lightship Lurcher through the canals.

The Montreal Transportation Co. at its annual meeting decided to apply for a new charter, so as to bring it under the provisions of the companies' act of 1902. The company has in service on the great lakes and St. Lawrence river three steamers, four schooners and thirty barges.

The Hampstead Steamship Co., Ltd., recently organized at Oak Point, N. B., with L. A. Currie, St. John, as president and F. S. Mabee as manager, has purchased the steamers Hampstead and Elaine. These vessels will be placed in service on the St. John river in the spring.

The Western Lakes Transportation Co. proposes buying or building a steamer for next season's trade on the upper lakes. The company owns the steamer Wexford, bought in England in the spring. Capt. W. J. Bassett is manager.

Plans for the permanent steel sheds at Montreal harbor have been completed and tenders will shortly be asked. The sum of \$3,000,000 has been provided to meet the cost of the work. J. Kennedy is chief engineer for the work.

The Dominion government steamer Stanley, which was

caught in the ice last winter and held for some weeks between Prince Edward island and the mainland, has been thoroughly repaired for the coming winter's work.

Capt. W. H. Taylor of the C. P. R. steamer Lake Manitoba has been awarded the medal of the Royal Humane Society of Great Britain for rescuing the crew of the schooner Grenada in December, 1902.

The hydraulic lift lock on the Trent Valley canal at Peterboro, Ont., is completed. There will not, however, be any amount of traffic this season on that section of the canal.

Plans are being prepared by H. J. Cambie, division engineer of the C. P. R. at Vancouver, B. C., for the construction of extensive new wharves at Victoria.

From Desoronto, Ont., comes announcement of the death of E. W. Rathbone, president of the Desoronto Navigation Co.

A proposal is under consideration for the construction of a marine railway at Port Arthur, Ont.

#### AMERICAN MERCHANT MARINE.

By Leslie M. Shaw, Secretary of the Treasury.

The only unprotected American industry is its merchant marine. An act of congress, approved by George Washington and never repeated though frequently assailed, gives the American ship builder, the American shipwright, the American ship owner and the American flag a monopoly in our coastwise trade, and we have not only the most efficient service, but the cheapest coastwise rates in the world. Transcontinental railways have been granted liberal subsidies, until the United States has the best railway system in existence and the cheapest rates; through government encouragement and protection its factories turn out more manufactured products than any other two countries on the map; its agricultural interests are more valuable than those of any other country; the development of its mining industries has been encouraged by many direct congressional enactments so that its mineral output has passed the billion dollar line. Coastwise vessels unload upon the shores of a single state more iron ore than any foreign nation produces.

Without attempting to give the reasons therefor, I content myself with stating the fact that forty years ago we had only one-fourth as much foreign commerce to transport as we have now, yet we actually carried in American bottoms forty years ago three times as much foreign commerce as we carry today. These conditions may be satisfactory to you. They seem to be satisfactory to many. But they are not satisfactory to me. I am not ignorant of the argument that if foreign countries are willing to subsidize ships to carry our freight, it inures to our advantage. This might be a sufficient excuse for our supine indifference if there were no other consideration involved than merely carrying our freight across the Atlantic ocean in times of peace. Unfortunately, however, there are many other and weightier conditions.

During the Spanish war, which lasted less than 120 days, we purchased or chartered forty foreign vessels. In the meantime every city on the Atlantic and Gulf coasts was apprehensive of an unarmed attack, and every few hours the people at Mole St. Nicholas and Monte Cristo imagined they could hear firing to the southwest. If war were to be declared between any two of the great powers of Europe, our foreign commerce would be not only helpless but hopeless. I forbear reference to our military and naval condition, in the absence of available colliers and transports, were the United States to be involved in such a conflict. The proudest navy in the world is utterly worthless without coal.

As certain as the world revolves the time will come when our people will give more heed to securing a respectable share of the trade of South American republics, South Africa, the islands south of the equator and the countries washed by the Pacific ocean. And there are no such agents of commerce as representatives of transportation companies. Suppose we now had regular lines of steamship communication between our ports and the countries I have mentioned, the government paying the loss until our trade should be established. What would be the result? A representative of these lines would wait at the door of every factory in the land begging for the production of goods specially designed to meet the peculiar needs, desires and whims of the countries for which they were intended. And mark you, gentlemen, a foreign market for \$1,000,000 of manufactured products means a domestic market for at least \$800,000 of labor.

Nor would this be all. The establishment of trade in these countries would be followed by American warehouses, in American branch offices and the American banks. The conflict between the great powers of the world is no longer military but commercial. Europe is not seeking to establish naval stations in the direction I have indicated, but she has already established commercial stations there, and out of these are liable to rise complications fully as intricate and vastly more delicate. Fortunately the Venezuelan matter is being settled by arbitration. God grant that all difficulties of this character that may hereafter arise on the western hemisphere may be solved in the same way. If we had our share of the commerce to the south and west of us, instead of a paltry 10 per cent., we would be in a position to insist that they should be so settled. I am not contending for ship subsidies, if any more feasible course can be devised. But if ship subsidies will ensure us a merchant marine, then I am for ship subsidies. If some other measure will ensure a merchant marine, then I am for some other measure. If several measures combined will ensure a merchant marine, then I am for all such measures.

## NEW SHIPPING BILLS.

Measures that will be Supported by Congressmen who are Opposed to Subsidies—Based upon a Line of Discriminating Duties—Full Text of the Principal Bill.

Readers of the Marine Review who have read from Wm. W. Bates of Denver, Col., formerly commissioner of navigation, numerous communications regarding our foreign-trade shipping have a general knowledge of his views as to what congress should do for the American ship. Mr. Bates is opposed to subsidies and favors discriminating duties. A great many people well informed as to ships agree with him. Mr. Bates says that the bill (H R No. 34) introduced in the house of representatives recently by Congressman Wm. Sulzer of New York is a proper measure for the recovery of our ocean carrying trade. It will therefore be of interest to give in full the provisions of this bill. Mr. Sulzer is a democrat. Mr. Greene of Massachusetts has introduced in the house another bill containing substantially the same provisions as the Sulzer bill. Mr. Greene is a republican. Mr. Sulzer says he will make a strong fight to have the bill passed and will endeavor to get a committee hearing at the earliest possible day. Mr. Greene says he will also exert himself specially in the matter.

Mr. Bates refers to these measures as non-partisan. "They are perfectly constitutional," he says, "their method being the 'regulation of commerce with foreign countries,' as provided for in that instrument expressly for the encouragement of navigation. A subsidy bill for the marine in general would not be constitutional—it would not regulate our trade, it would not be effective, it would not withstand very long the disapprobation of the people if passed, and it would not reform the policy of 'maritime reciprocity,' so-called, under which, and by reason of its existence, our ocean carrying trade has been lost. A subsidized ocean mail service is a national necessity, that is constitutional, and is provided for in the Greene and Sulzer bills. But the regulations of commerce, which are essential to our success, are the main reliance of the new measure. Only about a tenth of the marine necessary for our foreign commerce can be connected with the mail service. It is therefore plain that both of these bills, now before the congress, should command the support of every friend of American shipping, as being the only complete constitutional measures ever introduced."

The full text of the Sulzer bill follows:

Be it enacted, etc. that the law relating to the duties of tonnage, to the tariff on importations of foreign merchandise, and to the ocean mail service in force when this act shall be approved, be, and the same is hereby, supplemented and amended as follows:

## PROVISIONS AS TO TONNAGE DUES.

Sec. 1. That a duty of \$1.25 a ton on the gross admeasurement, in addition to the regular duty imposed on tonnage by law, shall be levied and collected from every vessel not of the United States that shall arrive with merchandise, passengers or mails, to be landed in the United States from a country, its colony or possession, to which said vessel does not belong.

Sec. 2. That a duty of 60 cents a ton on the gross admeasurement, in addition to the regular duty imposed on tonnage by law, shall be levied and collected from every vessel not of the United States that shall arrive in ballast or without merchandise or passengers to be landed in the United States from a country, its colony or possession, to which said vessel does not belong.

Sec. 3. That a duty of 30 cents a ton on the gross admeasurement, in addition to the regular duty imposed on tonnage by law, shall be levied and collected from every vessel not of the United States that shall arrive in ballast or with merchandise or passengers in a proportion less than one-fourth of her capacity for the same from the country, its colony or possession, to which said vessel may belong; but every vessel coming direct from her own country, its colony or possession, with merchandise or passengers in excess of one-fourth of her capacity for the same to be landed in the United States shall not be subject to an additional or extra tonnage duty unless the country from which she comes direct charges an additional or extra tonnage duty to vessels of the United States, in which case the extra duty per ton of the vessel's country shall be added to the extra duty per ton of our country, and the sum so found shall be the full charge per ton for additional or extra duty to be collected. Surveyors of tonnage shall certify the proportion of carrying capacity occupied by passengers or freight.

Sec. 4. That a duty of \$2 a ton on the gross admeasurement, in addition to the regular duty imposed on tonnage by law, shall be levied and collected from every vessel not of the United States that shall arrive from one foreign country under engagement to load for another foreign country, or that shall effect such engagement after arrival, there being one or more vessels of American registry in port listed at the custom house as ready to engage for the same or a similar voyage.

Sec. 5. That a duty of 50 cents a ton on the gross admeasurement, in addition to the regular duty imposed on tonnage by law, shall be levied and collected from every vessel that shall enter a port of the United States, either with or without cargo, passengers or mails, if she has stopped on her way at a port of a country not her own for the purpose of receiving merchandise, passengers or mails, to be landed in the United States, unless said vessel shall have been built in the United States.

Sec. 6. That a duty, to be termed light tax, of 6 cents a ton on the gross admeasurement of every merchant vessel not of the United States that shall enter a port of the United States shall be

levied and collected on clearance for sea, unless in cases where any such vessel shall clear in ballast or shall have been built in the United States.

## PROVISIONS AS TO TARIFF DUES.

Sec. 7. That a rebate of tariff duties shall be allowed and deducted on all foreign goods, wares and merchandise to the extent of 5 per cent. ad valorem in cases where the specific and ad valorem duties together amount to less than 25 per cent. of the value of the articles, and to the extent of 10 per cent. in cases where the specific and ad valorem duties together amount to more than 25 per cent. of the wholesale value of the articles in the market of the port where the same may be brought in by a vessel of the United States. And in cases where minimum or reciprocity duties are imposed by tariff law on goods, wares and merchandise imported, a rebate shall be allowed and deducted to the extent of 2½ per cent. ad valorem in cases where the specific and ad valorem duties together amount to less than 25 per cent. of the value of the articles, and to the extent of 5 per cent. ad valorem in cases where the specific and ad valorem duties together amount to more than 20 per cent. of the wholesale value of the articles in the market of the port where the same may be brought in by a vessel of the United States.

Sec. 8. That no other or higher duties than those imposed as regular by tariff law shall be levied, collected or paid on any goods, wares or merchandise imported direct by a vessel of the country, its colony, or possessions which produced the same, or of a country through which said merchandise necessarily passed to reach a market; but on all goods, wares and merchandise imported direct by a vessel not of the United States and not belonging to the country, its colony, or possessions where said goods, wares and merchandise were produced an additional duty of 10 per cent. ad valorem shall be levied, collected and paid; and on all goods, wares and merchandise imported indirect by a vessel not of the United States from any country, its colony, or possession not that of the production and original exportation of said goods, wares and merchandise the additional duty as aforesaid shall be 15 per cent. ad valorem. And in cases where no duties are imposed by tariff law on certain goods, wares and merchandise imported, and the same have been brought in by a vessel not of the United States direct from its own country, colony, or possession where the same were produced, there shall be levied, collected and paid a duty of 4 per cent. ad valorem; but if such goods, wares and merchandise shall be brought direct from a country to which the importing vessel does not belong, but which was the place of production, then the duty as aforesaid shall be 8 per cent. ad valorem; but if such goods, wares and merchandise so imported be brought from a country that did not produce the same, then and in that case the duty as aforesaid shall be 12 per cent. ad valorem, valued in the market of the port of entry. In cases where minimum or reciprocity duties are imposed by tariff law on goods, wares and merchandise imported there shall be levied, collected and paid full rates of duty, if the same shall be brought in by vessels not of the United States or not of the reciprocating country from which such goods, wares and merchandise have been exported; or if the same, not being the growth, production or manufacture of a country contiguous to the United States, shall be brought across the line from such country. And the additional duties imposed under this section shall apply also to all cases where goods, wares and merchandise shall have been transferred from a foreign vessels or land vehicle at any place to a vessel or land vehicle of the United States for the purpose of convenience or of evading the provisions of this act.

Sec. 9. That a duty of 20 per cent. ad valorem, in addition to the duties imposed by tariff law and also to the additional duties required by Sec. 8 of this act, shall be levied, collected and paid on all goods, wares and merchandise imported by a vessel not of the United States from a country to which the importing vessel does not belong, unless the importation shall be the growth, production or manufacture of a country at peace with the United States. And all goods, wares and merchandise imported by a vessel not of the United States, that shall be admitted to storage in bonded warehouse with lawful tariff duties unpaid for a period exceeding five days, shall be charged and shall pay an additional duty of 15 per cent. ad valorem, but a rebate of 5 per cent. shall be allowed in all cases where such merchandise shall be re-exported and cleared outward in a vessel of the United States.

Sec. 10. That all collections of tonnage and tariff duties, light and entrance taxes, and additional tonnage and tariff duties provided by this act to be levied, collected and paid, and all fines, penalties and forfeitures accruing to the treasury from violations of the navigation laws of the United States, this act included, shall, after the passage of this act, be set apart in the treasury as a special fund from which to pay, first, for the support of marine hospitals according to law, and, second, from which to pay premiums to exporters of merchandise for manifesting preference for the employment of vessels of the United States not owned by themselves.

Sec. 11. That on and after one year and twenty days from the passage of this act there shall be paid out of the special export fund in the treasury, provided for by Sec. 10 of this act, to the exporters of goods, wares, merchandise and precious metals to foreign countries in vessels of the United States, registered pursuant to the laws of the United States, and not owned wholly by themselves, as follows: A premium of ½ of 1 per cent. upon the cash valuation of each shipment to a foreign port distant by sea not less than sixty-five miles from the tidal boundary of the mainland of the United States; and a premium of 1 per cent.

upon the cash valuation of each shipment to a foreign port not less than 400 miles from the port of departure in the United States; and a premium of 1½ per cent. upon the cash valuation of each shipment to a foreign port not less than 1,000 miles from the port of departure in the United States; and a premium of 2 per cent. upon the cash valuation of each shipment to a foreign port not less than 2,000 miles from the port of departure in the United States; and a premium of 2¼ per cent. upon the cash valuation of each shipment to a foreign port not less than 3,000 miles from the port of departure in the United States; and a premium of ¼ of 1 per cent. additional shall be paid for each 1,000 miles above 3,000 miles to a foreign port from the port of departure in the United States, that is to say, for a distance of 4,000 miles, 2½ per cent.; for a distance of 5,000 miles, 2¾ per cent., and so on, the premium for 10,000 miles being 4 per cent., which shall be the highest premium that shall be paid; and such premiums to an exporter, as hereby provided, shall be payable to his order upon report of the clearance of the vessel, with a statement of the collector of the port fixing the value of the shipment, which must be sworn to by an appraiser for the United States, within a period of ten days, according to such regulations as the secretary of the treasury shall prescribe and promulgate, distances between ports to be determined by the hydrographic office of the navy department and stated in sea miles.

#### PROVISIONS AS TO MAIL CARRIAGE.

Sec. 12. That the postal act approved March 3, 1891, be, and it is hereby, amended to provide and to read as follows:

Clause 1. The postmaster-general shall, as often as once in each year, advertise for informal proposals for the carriage of mails by sea in American-owned mail and naval steamships between such ports of our own and other countries as to merchants may seem advantageous. These advertisements shall be inserted weekly four times in a paper printed in Boston, New York, Philadelphia, Baltimore, New Orleans, Galveston, Norfolk, Charleston, Savannah, Brunswick, Mobile, San Francisco, Portland and Seattle, and shall describe the service as that of mail and naval steamers best adapted to promote the postal and commercial and naval interests of the United States, and to subserve the interests of their owners as well. Proposers will state the size and speed of vessels, number of trips yearly, remuneration required, time when service could be begun, and such other particulars as may seem useful for the government to consider.

Clause 2. Within two months after receipt of informal proposals the secretary of the navy and the postmaster-general shall together consider their contents, the wants of the naval service and the needs of the postal service and determine upon a schedule of requirements that will satisfy both services. The secretary of the navy will control the plans for the vessels and the postmaster-general will decide upon the postal programme. The secretary of the navy and the postmaster-general together shall advertise formally to let contracts for the running of the steamships required. Such advertisements shall be inserted in the same papers that called for informal proposals four times weekly, describing the route, the principal particulars of construction of the ships, the size and speed, the number of trips, the times of sailing, and the time when the service shall begin. The details of the mode of advertising and letting such contracts shall be conducted in the manner prescribed in the revised statutes for the letting of inland mail contracts so far as the same shall be applicable to the ocean mail service. Every contract must have the approval of the president, and none shall exceed the limit of twenty-five years.

Clause 3. The vessels employed in the mail service under this act shall be officered by citizens of the United States, and each contract shall provide that on departure a certain proportion of the crew shall owe allegiance to the United States, to wit: During the first two years one-fifth thereof; during the next four years one-fourth thereof; during the remainder of the time one-third thereof at the least. Where persons of the colored races may be employed as seamen or firemen in company with white men, separate quarters for eating and sleeping must be provided. It may be stipulated in the contract that mails may be brought from abroad, the foreign country paying for the service; also that passengers and baggage and freight may be carried both outward and inward. After Jan. 1, 1906, the mails shall be sent foreign by vessels of the United States, and no others, without the special authority of congress; and in cases of need, when private enterprise fails to undertake or carry on the service at reasonable or lawful rates of remuneration, the secretary of the navy shall have authority, and it shall be his duty, to send mails foreign or bring them home by suitable vessels of the navy until the further order of congress.

Clause 4. That all steamships employed in the postal service and hereafter built for it shall be adapted and constructed and made ready to receive guns for prospective use as auxiliary naval cruisers, scouts or transports in time of war, and in future the plans and specifications shall be agreed upon by and between the owners and the secretary of the navy, the strength and stability to be sufficient to carry the armament intended when in naval service, and the tables of materials of construction of hull and machinery to be such as will command the highest classification given by American marine inspection and rating. And all vessels for postal service hereafter built shall be constructed under the inspection of a naval officer detailed by the secretary of the navy, to whom he will report in writing the progress made monthly, whether or not the contract is being well performed, and when the trial trip may be made; and no vessel not approved by the

secretary as fulfilling the contract shall be accepted for the service.

Clause 5. The annual compensation to be agreed upon and paid for such ocean mail service as may be contracted for under this act shall be reasonable and as low as responsible bidders can afford to perform the same, having regard to the encouragement to vessels that is provided by this act, to the commercial circumstances in each case, and to the rate of compensation for similar service paid by other countries. In any case where a bid may be deemed too high, the programme of service may be modified and the route readvertised. Payments for the service to be made at the close of each round voyage. Where the service may fail to fulfill the contract for a space of six months the president may declare the contract forfeited, and thereupon the route shall be readvertised and let to another bidder.

Clause 6. Upon each mail and naval steamship the United States shall be entitled to have transported, free of charge, a messenger, whose duty it shall be to receive, sort, take in charge and deliver the mails to and from the United States, and who shall be provided with suitable room for the accommodation of himself and for the safe carriage of the mails.

Clause 7. The officers of the United States navy may volunteer for service on said ships, and when accepted by the contractor or contractors may be assigned to such duty by the secretary of the navy whenever in his opinion such assignment can be made without detriment to the service, and while in said employment they shall receive furlough pay from the government and such other compensation from the contractor or contractors as may be agreed upon by the parties; provided that they shall only be required to perform such duties as appertain to the merchant service.

Clause 8. Said ships shall take as cadets or apprentices one American boy under twenty-one years of age for each one thousand tons gross register, who shall be educated to the duties of the service as seamen, rank as petty officers, and receive such pay for their time as may be reasonable.

Clause 9. Said ships may be taken and used by the United States as cruisers, scouts or transports at any time upon payment to the owners of fair actual value of the same at the time of the taking, and if there shall be a disagreement as to the fair actual value between the United States and the owners, then the same shall be determined by two impartial appraisers, one to be appointed by each of said parties, they at the same time selecting a third, who shall act in said appraisal in case the two shall fail to agree.

Clause 10. All vessels not of the United States coming with passengers from a country to which they do not belong shall pay to the collector of the port an entrance tax of \$20 for each and every such passenger which they shall land with his or her effects.

#### GENERAL PROVISIONS.

Sec. 13. That marine underwriters or insurance companies of foreign countries may, in person or through agencies in the ports of the United States, issue policies in conformity with state regulations on shipments of goods, wares and merchandise to be exported, but any discrimination made in the clauses of policies, in the premium rates, or effected otherwise, which shall tend to favor the employment of foreign vessels, or tend to disfavor the engagement and use of vessels of the United States, shall be deemed a misdemeanor punishable by a fine, as a penalty for the first offense, in a district court of the United States, the sum thereof not exceeding \$5,000; for a second offense the fine shall be not less than \$10,000, and for the third and each offense after the second the fine shall be not less than \$15,000, and suits may be brought by any citizen of the United States. In any such suit it shall be no defense that the rules of any association of underwriters, ship owners or merchants, not citizens of the United States, or that the inspection and classification of any register book not owned and printed in the United States can be claimed to justify the discrimination that may have been the subject of complaint.

Sec. 14. That on and after six months from the date of approval of this act it shall be lawful for the space of two years, but no longer, for any bona fide citizen, citizens, or domestic corporations, engaged in, or intending to engage in, the foreign carrying trade of the United States, to import and enter at the custom house for his or their own use in said trade, but not in the domestic trade or to be held for sale or sold to others, any vessel or vessels suitable therefor, of size not less than 1,000 tons gross, and of age not more than three years, and have the same duly registered as a vessel or vessels of the United States, but upon the following conditions, nevertheless, to wit: That all vessels imported in the first six months of the term of two years as aforesaid shall pay a duty of \$3 per gross ton; those imported in the second six months shall pay a duty of \$4 per gross ton; those imported in the third six months shall pay a duty of \$5 per gross ton; those imported in the fourth six months shall pay a duty of \$6 per gross ton of measurement. The treasury department may allow credit on duties for imported tonnage to the extent of six and twelve months' time on secured notes of owners. And it shall be unlawful, upon penalty, as for misdemeanor, punishable by fine not over \$1,000 in a district court of the United States, for the master, owner, or agent of any foreign-built vessel not duly registered, enrolled or licensed, to fly the flag of the Union from or abait the aftermost mast, spar or pole, except as a signal of distress.

Sec. 15. That the regular duties of tonnage shall be paid alike by American and foreign vessels when entry is made. En-



trance or passenger tax shall be paid when permit is given for the landing of passengers from vessels not of the United States, brought from countries to which said vessels do not belong. All additional tonnage duties and the light tax to be paid when clearance of vessel is made, but if clearance be delayed, then, at latest, at the end of four months from date of entrance. American vessels carrying crews of which three-eighths of the number are citizens shall have rebate of tonnage tax to the extent of 20 per cent.; if four-eighths of the crew are citizens the rebate shall be 40 per cent.; if five-eighths of the crew are citizens the rebate shall be 70 per cent.; and if six-eighths of the crew are citizens the rebate shall be 100 per cent. The United States shipping commissioner shall ascertain and certify to the collector the proportion of citizens in each crew where rebate of tax may be demanded. Regular apprentices as seamen or engineers, if citizens, shall count as men in computing rebate of tax. And in all cases where vessels shall be fined by collectors in accordance with the statutes, it shall be unlawful for the secretary of the treasury or the secretary of commerce and labor to remit any portion thereof; and it shall also be unlawful for the commissioner of navigation to order refunds of tonnage taxes after the same have been paid into the treasury.

Sec. 16. That Sec. 10 and Sec. 12 of this act shall take effect upon its passage, Sec. 14 in six months thereafter, and Secs. 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 15 and 16 in one year and twenty days thereafter, and all acts or provisions of law in conflict herewith are hereby repealed; also any and all articles or clauses in existing conventions or treaties in contravention herewith are annulled and abrogated in conformity with the stipulations of said agreements and the rights and equities of the United States, and formal notice of the congress of the United States is hereby given that in one year from the passage of this act all convention or treaty provisions for maritime reciprocity are receded from on the part of the United States, and all enactments therefor are by this act repealed.

#### MODERN COAL APPARATUS.

New York, Dec. 2.—The steadily-increasing bulk in which coal is conveyed by water and rail to power plants and storage stations, where it has to be raised to a more or less height, be broken into proper stoking size—when necessary—and stored in high pockets for future consumption or delivery, has led to a demand for hoisting and distributing machinery of greater speed and capacity than anything heretofore in use for the purpose. Demurrage charges on vessels and cars, with extra expense in way of wages to men employed—made unavoidable from time consumed in unloading cargoes—giving literal proof of the truth of the adage "time is money," has been the main incentive for a desire for something in advance of former methods, which, for reasons given, were found to be wasteful to the verge of extravagance; a state of affairs not to be tolerated where economical management is desired. As this is the only kind of management by which business can be made a success, the desire for something better in way of machinery for unloading and storing coal grew until it developed into a demand.

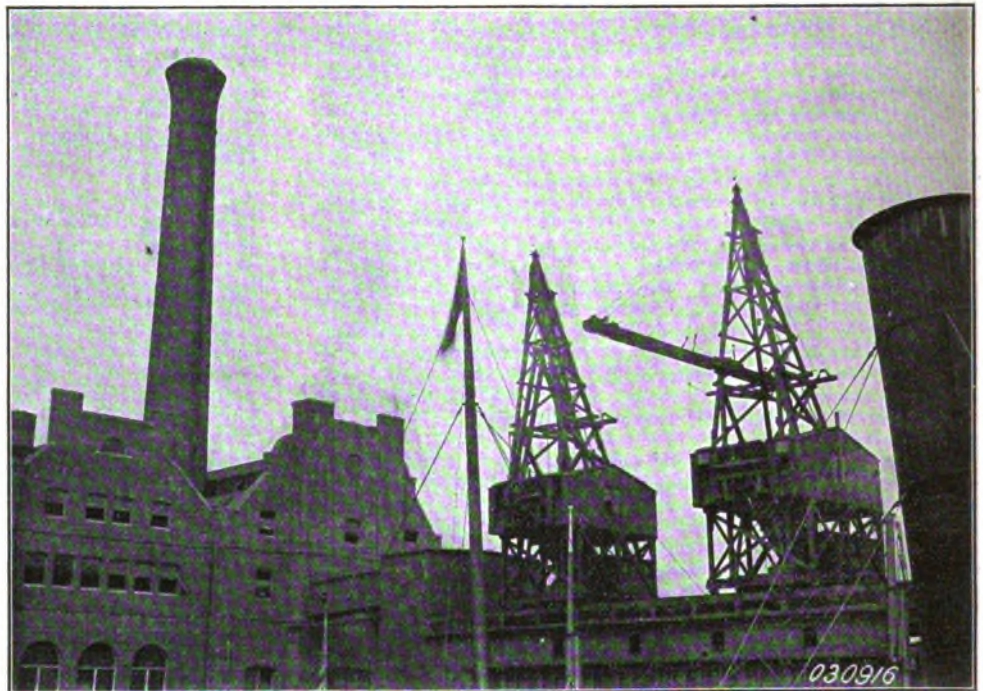
A desire to supply such demand has for some time enlisted the best efforts of mechanical engineers versed in this line, but that the demand has but lately been complied with is not to be greatly wondered at when the difficulties to be contended with are taken into consideration. It must be borne in mind that the problem of perfecting such a device as would fill all requirements is quite different from, and much more complete, than that of designing a machine for the ordinary bulk unloading and storage of coal, ore, etc., from vessels or cars on the ground level; as the element of height very materially affects the general machinery design. Then again, the work demanded of a coal hoisting tower's mechanism is of the hardest description to which machinery can be subjected, resulting from the ignorance of mechanics among unskilled labor employed in its operation and the unavoidable shocks incident to the nature of the work it is called upon to perform, which is complicated by such shocks being subject to constant changes, according to the nature and size of pieces of coal handled, which may vary from "pea" contained in open barges or cars to that of cubes 2 ft. square loaded in decked vessels having small hatches.

Until recently the usual capacity of a single coal hoisting and storing tower—hoisting the material to an elevation of about 50 ft.—has been from forty to sixty tons an hour, but occasionally, under the most favorable conditions, this has been increased to from ninety to 100 tons. While this speed was, in its day, recognized as a great advance on former methods, it is now justly con-

sidered far too slow to answer present conditions. With the knowledge of this fact in view many have sought in vain for a remedy—or rather a mechanism—to supply the demand.

"Where there is a will there is a way," and while many had the will to accomplish the desired object, and some advancement was made in hoisting and conveying appliances for coal, it seems to have remained for the well-known engineering firm of C. W. Hunt Co., West New Brighton, Staten Island, New York, not only to have the will but also to find the way of greatly improving on former devices used for this purpose. This fact is amply attested by a late performance of one of their standard "Hunt" steeple-tower rigs, a coal hoisting, cracking and conveying device installed by the company at the Lincoln wharf power station of the Boston Elevated Railway Co. In this instance, by one of these towers, run-of-mine bituminous coal was hoisted 90 ft. above tide water from a ship's hold through a hatch, cracked to mechanical stoking size and delivered to the storage pockets at the rate of 320 tons an hour, being an advance of about 200 per cent. upon the previous best record. In a test of speed with this mechanism it was found that the time required in hoisting two tons of coal from the hold of a vessel to nearly 200 ft. above was but six seconds, while the round trip, including running the shovel out of the boom, lowering it into hold of ship, filling it with two tons of coal, raising it and discharging coal into hopper occupied but twenty-two seconds.

In this latest tower device of the C. W. Hunt Co., of which illustration of the general design that may vary to suit surroundings and requirements is herewith given, the ordinary small steam shovel has been supplanted by an automatic one of two tons capacity, and the coal cracker, installed in the tower, has a capacity of over five tons a minute. The moving gear and coal cracker are electrically driven, with the hoisting engine direct connected. The conveying mechanism traverses, overhead, the whole length of the storage pocket, moving full 30 ft. at a time without changing steam connection. Thus a single tower is enabled to operate on each hatch of a vessel in turn, or several towers can work simultaneously. The boom, which has an overhang of 40 ft., is made to fold up, thus enabling it to be worked free of a ship's rigging, and to operate successfully on coal vessels of smallest to largest dimensions.



Steeple-tower Rig manufactured by the C. W. Hunt Co., Staten Island, New York.

It is understood that some sort of a report will be made by the Cunard turbine commission before the holidays. The commission has been making a variety of experiments with a 40-ft. model. In the case of vessels to make a sea speed of 25 knots an hour there are no precedents which are well enough established to rely upon. It has been asserted by those whose experience would seem to warrant them in making the assertion that the limit of the propelling power now in use has been reached. The enormous power required to develop 25 knots an hour is quite beyond previous experience with the marine engine of the period—72,000 H. P.—but it is pointed out by experts that precisely the same thing was said twenty-five years ago when a speed of 14 knots was desired. Engineers all over the world will view the building of these vessels with lively interest.

The question of the disposition to be made of the cruisers Cleveland and Denver, which were found lacking in speed, has been determined by Secretary Moody who has decided to recommend to congress that the penalties be remitted. The Cleveland is now in commission but the Denver is still in the hands of her builders.



By PROF. W. S. LELAND.

The displacement table shown on plate I embraces two features not embodied in the usual form of calculation. First, the

function of the area of the transverse station between water lines. On plate 1 this is accomplished by adding three times the ordinates on *WL—2* to the ordinates themselves. This sum is recorded in the column headed "function of areas," and when summed up in precisely the same manner as the columns of ordinates, gives the function of volume, which checks with the function of volume previously found. The ordinates can be multiplied by their respective levers, and the function of moments summed up in a similar manner. Half stations involve some little complexity but can readily be used if needed.

PLATE I.

calculations are figured in distinct slices, and, since the Simpson's rule requires at least three ordinates, this feature is arranged to give results at every alternate water line, thus enabling one to plot the results in satisfactory curves. The second feature consists in arranging the ordinates so that the sums of the even ordinates may be multiplied by the common multiplier 4, and the odd ordinates by 2, instead of arranging them in the usual manner and multiplying them by 4 and 2 alternately. Such an arrangement not only reduces the number of multiplications but greatly reduces the number of figures used in the calculation. In the upper left-hand corner of the sheet the odd ordinates 3, 5, 7, etc., are found together with their proper leverages, and just below them are the ordinates 2, 4, 6, etc. The odd ordinates are added together and multiplied by 2, the even ordinates by 4, and the sums of these multiples, which represent functions of the areas of water lines, are multiplied by the 1 — 4 — 1 multipliers; the sums of these multiples give a function of the volume between water lines. If the original ordinates at any given station are multiplied by 1 — 4 — 1, the sums of these multiples will give a

By taking the lowest water line, which is here called No. 1, at a suitable distance above the base line, a triangular-shaped appendage will usually be cut off, which can, of course, readily be figured both for displacement and moment. It is very convenient to let the height of appendage be 1 ft., for then the half ordinates of water line 1 become at once the areas of appendage. The half

areas of appendage are divided by  $\frac{h}{3}$  so that their sum may be added directly to the function of volume. If the distance between water line 1 and the load line is divided into eight or nine equal intervals, and a half water line taken between water lines 1 and 2, a sufficient number of points may be obtained to enable one to plot an entirely satisfactory set of curves.

A brief comparison of the number of figures and of the number of mental operations involved in this form of sheet as compared with the usual type may be of interest. There are, to be sure, a few more additions in the sheet here shown, but the difference is small, and is far outweighed by the greater ease of checking work in the new form. The table would tend to show that the new form of sheet involves something more than half the

PLATE V

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is  $x$  tons to the inch and the scale of righting arms is  $y$  feet to the inch, then the tangent of the plotted curve is  $x \div y$  times as great as if the curve were full size

Let Fig. 2 represent an inclination at the water line  $WL$ .  $B$  will be the center of buoyancy of the inclined carene,  $BZ$  will be the righting arm, and  $\Delta$  the displacement. Suppose the vessel should now be immersed an infinitesimal amount and float at the water line  $W_1L_1$ . The increase in displacement could be represented by  $d\Delta$ . Let  $g$  be the center of gravity of the water line  $WL$ , which will also be the center of buoyancy of this narrow slice. The moment of  $\Delta$  about the axis through  $B$  is zero, and the moment of  $d\Delta = d\Delta \times gh$ .

Then the change in righting arm will be  $\frac{d\Delta \times gh}{\Delta + d\Delta}$ . It can be

shown that the expression for the tangent becomes  $\frac{gh}{\Delta + d\Delta} = \frac{gh}{\Delta}$

$$= \frac{og - oh}{\Delta}$$

Since  $oh =$  righting arm, we have the tangent equal to the difference between the distance to the center of gravity of the water line and the righting arm divided by the displacement. If the center of gravity should come at  $g^1$  instead of at  $g$ , this difference would still hold, but  $hg^1$  would be negative and would be equal to  $(-og) - oh$ , and the tangent would be negative.

If  $r_1$  represents the ordinates on the immersed side, and  $r_2$  the ordinates on the emerged side, the area of the inclined water line  $WL$  will be equal to  $\Sigma (r_1 + r_2) \times \frac{L}{9}$  (by Tchebycheff's rule) where  $L$  equals the length of the vessel, and the moment will similarly be equal to  $\frac{1}{2} \Sigma (r_1^2 - r_2^2) \times \frac{L}{9}$ . Therefore

$$\frac{\Sigma (r_1^2 - r_2^2)}{\Sigma (r_1 + r_2)} = og.$$

On plate 5, in the upper left-hand corner, is a column for recording the integrator at each inclination. In the three following columns may be recorded the  $r_1$ ,  $r_1^2$ ,  $r_2$ , and  $r_2^2$  of each water line. By use of the slide rule the entire work for one angle of inclination can be done in less than one hour, and a complete calculation for six angles, including the preparation of the body plan, has been done by a good draftsman in six hours. This would make the entire calculations of both displacement and stability for practical work a matter of about sixteen hours, exclusive of plotting the curves.

UP-TO-DATE MEASURES IN HILL SHIPS.

The two immense ships building at New London, Conn., for the Great Northern Steamship Co. (James J. Hill), to ply between the Pacific coast and the orient, have been the subject of a great deal of comment in ship building circles, especially as a ship yard was built up around them instead of the yard being first established and the ships built afterwards, but whatever may be said of these great vessels, it is certain that every effort is being made to give them the best that is to be had in way of modern improvement. The latest announcement is that these first vessels of the Hill Pacific fleet, Minnesota and Dakota, are to have four "Type A" Clayton fire extinguishing and disinfecting machines. Two of these machines will be placed on each ship, this number being necessary on account of the mammoth size of the vessels and the number of compartments into which they are divided.

The order for this apparatus was lately received by the Clayton Fire Extinguishing & Disinfecting Co. of New York from the Eastern Ship Building Co. of New London, Conn., at the yards of which the vessels are being built.

This move on the part of the Great Northern Steamship Co. only emphasizes the well-known business astuteness of the man whose practised hand holds the helm that has steered every enterprise, undertaken by him and his colleagues, into the safe harbor of success. He is evidently not only a firm believer in the well-known axiom "An ounce of prevention is worth more than a pound of cure," but puts the axiom into everyday practice in his business affairs. But it does not require the acumen of a James J. Hill to realize that what will exempt a ship from the dangers of a fire at sea, keep it free of vermin and make it immune to the germs of contagious diseases and plague, is something that every vessel sailing ocean, lake or river, should be provided with; not only for sanitary reasons, but on the score of economy as well, the latter soon manifesting itself in reduced insurance rates and protection of freight from rodents and destructive insects.

Admiral H. C. Taylor in his annual report urges a material increase in the number of ships in the navy. He thinks that a squadron of eight should be stationed in the Caribbean sea, five of the improved Olympia type, and three specially constructed light-draught vessels for river work. He recommends also the construction of eight vessels for training purposes to have a sea speed of 16 knots. Six new cruisers are recommended for the European station. He says that the Asiatic station needs six cruisers of an improved Olympia type, four cruisers of the scout type and two small gunboats.

Secretary Moody has decided to recommend the construction of six additional gunboats of the Nashville type to cost about \$250,000 each for South American service.

BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (SEPTEMBER, 1903)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	-	-	-	-	-	-	-	355,560	H. P.
English Royal Navy	-	-	-	-	-	-	-	929,300	"
Russian Imperial Navy	-	-	-	-	-	-	-	227,500	"
Japanese Imperial Navy	-	-	-	-	-	-	-	122,700	"
Austrian Imperial Navy	-	-	-	-	-	-	-	56,700	"
Italian Royal Navy	-	-	-	-	-	-	-	13,500	"
Chilian Navy	-	-	-	-	-	-	-	26,500	"
Argentine Navy	-	-	-	-	-	-	-	13,000	"
The "Messageries Maritimes" Company	-	-	-	-	-	-	-	87,600	"
Chemins de fer de l'Ouest: (The French Western Railway Co.)	-	-	-	-	-	-	-	18,500	"
plying between Dieppe and Newhaven	-	-	-	-	-	-	-		
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**MANNING'S YACHT REGISTER.**

Anyone who is interested in yachts and yachting or in reaching the yachting trade cannot afford to be without Manning's Yacht Register. It is an excellently printed directory in two parts. The first part gives reproductions of yacht club flags in their original colors, including the flags of all the officers. This is followed by foreign yacht club flags, the private signals of yacht owners, the storm, information and hurricane signals of the weather bureau, the flags of all nations and the international code of signals. So various and extensive are these flags that sixty-five pages are consumed in reproducing them. Then follows the register of steam and sail yachts, giving the rig, official number, dimensions, engines and boilers, designers, builders, owners, home port and club. A list of yacht clubs is also given with their headquarters and the addresses of their secretaries. There is also an alphabetical list of yacht owners. The second part is an index to regattas, international races and racing numbers. Details are given of all the regattas of 1902, with the yachts competing, their dimensions, time allowance, and the results. This in itself is a work of extraordinary labor. The price of the register is \$10, and it is published at No. 45 Broadway, New York.

A very neat illustrated catalogue, just issued by the Kingsford Foundry & Machine Works, Oswego, N. Y., deals with centrifugal pumping machinery, for the manufacture of which the Oswego concern is known all over the country. The Kingsford foundry and machine shop equipments are modern, and with improved tools and machinery they are enabled to produce high-class work promptly, and with a system that insures accuracy and superior workmanship. They have a complete boiler plant and make a specialty of the manufacture of internally-fired boilers with rectangular or cylindrical furnaces, for stationary and marine work.

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**CHALLENGE POWER HACK SAW.**

A power hack saw, known as the Challenge and made by the Patterson Tool & Supply Co. of Dayton, O., is illustrated herewith.

This machine is capable of sawing metals up to 6 in. The company also makes a 4-in. saw and for a moderate extra charge furnish the 6-in. saw with a raised arm, making it capable of cutting 12-in. I beams and channels. They say of the 6-in. machine: "The ways are planed and gibbed, and wear can be taken up. The pitman, with 7/8-in. bearings, and the 1-in. rocker shaft have adjustable bearings. The crank shaft, 1 1/4 in. diameter, has an additional bearing in bracket just back of driving pulley. The vise is adjustable, forward and back, so that when one end of the saw wears out, the other end can be used. The vise jaws swivel. The main feature of the machine is contained in the friction, which in combination with the sliding counter-weight, gives positive feed, but on the return stroke relieves the saw and prevents dragging over the work. The machine is stopped automatically at the end of the cut. Adjustments are provided for securing perfectly straight cuts. The dimensions over all are: Length, 48 in.; width, 22 in.; height, 37 in.; weight, 350 lbs.; driving pulley, 16 in. diameter for 3-in. belt; speed, forty strokes per minute. Saws from 12 to 14 in. long can be used."



The International Longshoremen, Marine & Transport Workers' association is said to have made great progress in organizing marine workers on the Atlantic coast. Twelve out of sixteen unions in Greater New York have taken out charters from the longshoremen and four locals in Brooklyn are expected to cast their lot with the international body. In Boston three new unions have been enrolled.




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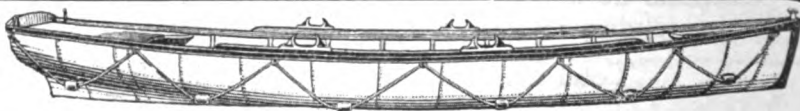
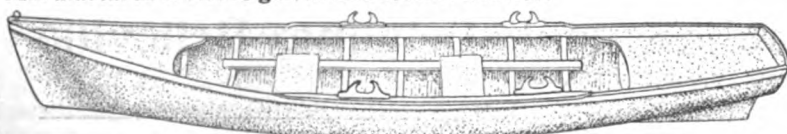
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## TRADE NOTES.

The Brown-Cochran Co., Lorain, O., and 26 Cortlandt street, New York, has issued a marine catalogue containing much valuable information on the general subject of marine installation of refrigerating machinery. It will be sent upon request to interested parties.

Gustave Wiedeke & Co., Dayton, O., manufacturers of boiler makers' tools, have built up through careful and conscientious attention to business a trade in their specialties that is of a lasting kind. Their concern is not a big one but they are very highly spoken of by all the marine boiler makers who have had dealings with them. They will be pleased to forward upon request printed matter descriptive of their tools.

A handsome catalogue has just been issued by the John A. Roebing's Sons Co., a business which was established at Trenton, N. J. in the spring of 1848. These works were the first in their line in America and have grown to be the first in the world. The catalogue covers 164 pages, illustrative and descriptive of their extensive plant, the various lines of articles which they produce and some of the important engineering enterprises which they have carried to a successful issue, many of which are the largest and most important of their kind in the engineering world.

Work is fast nearing completion upon the new power plant of the B. F. Sturtevant Co. at Hyde Park, Mass. This bids fair to be one of the most complete plants of its kind in the country, special care having been taken in connection with every detail to secure the highest efficiency and the most modern equipment. The plant will comprise four water-tube boilers, with stokers, supplied by Sturtevant forced draft, an economizer with Sturtevant induced draft, and a complete outfit of Sturtevant generating sets, together with condenser, air compressor, etc. The Sturtevant exhaust head is used for separating the water and oil from the exhaust steam.

A very attractive little pocket catalogue has just been issued by the Peerless Rubber Manufacturing Co., 16 Warren street, New York. On the cover is the figure of a man bearing a message under his arm. This message is detachable and is addressed to "You." The message says that the company made and sold

1,526 tons of Rainbow packing last year for the following reasons: Because it withstands the action of ammonia and other alkalies; because it will not harden under any degree of heat; because it needs no baking or following up; because the highest pressure will not blow it out; because it will make an air, steam, hot or cold water joint equally well; because joints can be repeatedly replaced; because it is a time-saver to the engineer; because it is the standard by which all other packings are gauged. The catalogue is well printed and well illustrated and worth sending for.

## AMERICAN SHIPS WANTED.

In the fiscal year ended June 30, 1903, the total importations into the Philippine islands were of the value of \$35,099,241, exclusive of government supplies. How small a share of this large amount was carried in American vessels is shown by the following analysis of nationality: British, 40 per cent.; German, 23.5; Spanish, 19.4; Norwegian, 8.6; American, 2.1; all other, 6.4.

Turning to the export side the showing on the \$39,668,366 total exports is worse for us: British, 76.2 per cent.; German, 5.4; Spanish, 6.3; Norwegian, 2.9; American, 1.7; all other, 7.5.

On the goods sent from the United States to the Philippines, valued at \$4,108,660, the showing for American ships is somewhat better, but still leaves us very far behind: British, 70 per cent.; American, 10; German, 5; all other, 15.

Exports from the Philippines to the United States amounted to \$14,000,000, of which 90 per cent. came to us in British vessels, and only 3 per cent. in vessels flying the American flag.

In his annual report, just published, Col. Clarence R. Edwards, chief of the bureau of insular affairs, war department, says: "The passenger steamers from San Francisco to the orient have been crowded during the past year. I am fearful that the few ships at present in that service will be inadequate after July 1, 1904, for the service between Manila and the United States Pacific ports." Something should be done to induce the entrance of more American vessels into the Philippines trade, so that all the profits and turn-over of American business may be kept in American pockets.

WALTER J. BALLARD.  
Schenectady, N. Y., Dec. 2, 1903.

## Dredging Plants for Sale.

For Sale.—Two dredging plants complete, consisting of two dredges, tugs Maytham and Duncan Robertson; also five dump scows and two flats, with sundry duplicate parts of machinery, etc.; also extra spud anchors and dipper teeth, etc.; all having been kept up in good working condition and comparatively new, and could be delivered at once on satisfactory sale. For further information as to capacity and prices of each plant inquire of James Pryor, Houghton, Mich. Dec 17

## For Sale—A Bargain.

One Brown Hoisting Machinery Company all iron and steel post jib crane, 15-ton capacity, 35 ft. 3 in. radius of hook 18 ft. 6 in. lift. The hoisting mechanism is driven by dust-proof motor. The crane is in excellent condition and has been a very satisfactory machine. A. Garrison Foundry Co., Pittsburgh, Pa.

## Tug for Sale.

Tug Warwick—Engine 15x17. Boiler allowed 110 lbs. steam. Both in first-condition. Hull practically new. Boat inspected and ready to run. Cheap for cash. Can be seen at Toledo, O. Apply to James Rooney, 1118 Collingwood ave., Toledo, O. tf

## Marine Boilers for Sale.

For Sale—A number of various styles of marine boilers in good repair. For further particulars apply to Howard S. Folger, Kingston Ont. tf

Galveston, Texas, Oct. 7, 1903.  
Sealed proposals, in duplicate, for grade raising at Galveston, Texas, involving over 11,000,000 cubic yards of filling, will be received by the Chairman of the Grade Raising Board, until 2 P. M., Dec. 7, 1903, and then publicly opened. For information apply to E. R. Cheesborough Secretary Grade Raising Board, Galveston, Texas.  
Dec. 8 C. S. RICHE, Consulting Engineer.

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## For Sale.

Tug Duncan City. Address, Geo. Pankrantz Lumber Co., Sturgeon Bay, Wis. tf

## For Charter or for Sale.

Steamer Longfellow: 11,000-15,000 cubic feet cargo capacity; 400 tons dead weight; twelve staterooms. Has been lately overhauled and is in first class condition. For further particulars apply to the New York & Porto Rico Steamship Co., No. 1 Broadway, New York. Dec. 10

## For Sale

Wreck of the steamer Walter L. Frost, stranded on South Manitou Island, Mich. Apply to Capt. W. H. Williams, Supt., Ogdensburg, N. Y. Dec 10

## Small Steam Barge for Sale.

I have for sale a small steam barge. Carries 250 tons. Address, Capt. F. E. Wood, Alexandria Bay, N. Y. tf

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New beautiful 100-ft. steam yacht, fully equipped. Owner physically unable to use yacht. Will sell for any reasonable offer. Yacht can be seen in Detroit. Address M. J. STEFFENS, 57 East Twenty-second st., Chicago. tf



Proposals for the Improvement of the Port of Iloilo, P. I.—Sealed proposals in triplicate will be received until noon, February 1, 1904, and thereafter publicly opened for the following work to be done at Iloilo, P. I. or as much thereof as may be completed for the sum of \$150,000 U. S. currency. The construction of 6,100 lineal feet of dike or fascine bank protection composed of piles, mattresses and stone. The dredging of 410,000 cubic yards of material in the river channel and the depositing of the material back of the dikes. Envelopes containing proposals should be plainly marked "Proposals for the Improvement of the Port of Iloilo, P. I." Plans, specifications and contracts can be obtained and examined at this office or at the U. S. Engineer's offices at New York, Chicago, San Francisco and Portland, Oregon; also at the Bureau of Insular Affairs, Washington, D. C. Bidders are invited to be present at 4 p. m., February 1, 1904, when bids for the work as a whole will be opened. Address all communications to the Consulting Engineer to the Commission, Santa Potenciana Building, Manila, P. I. J. W. BEARDSLEY, Consulting Engineer to the Commission. Dec. 24

Proposals for the Improvement of the Port of Cebu, P. I.—Sealed proposals in triplicate will be received until noon, February 1, 1904, and thereafter publicly opened for the following work to be done at Cebu, P. I. The construction of a bulkhead and dock about 2,600 feet long, the dredging of the channel adjacent to said bulkhead, and the filling in of the area immediately back of the same, or so much thereof as may be completed for the sum of \$350,000 U. S. currency. Envelope containing proposal should be plainly marked "Proposal for the Improvement of the Port of Cebu, P. I." Plans and specifications can be obtained and examined at this office or at the U. S. Engineer's offices at New York, Chicago, San Francisco and Portland, Oregon; also at the Bureau of Insular Affairs, Washington, D. C. Bidders are invited to be present at 4 p. m., February 1, 1904, when bids for the work as a whole will be opened. Address all communications to the Consulting Engineer to the Commission, Santa Potenciana Building, Manila, P. I. J. W. BEARDSLEY, Consulting Engineer to the Commission. Dec. 24

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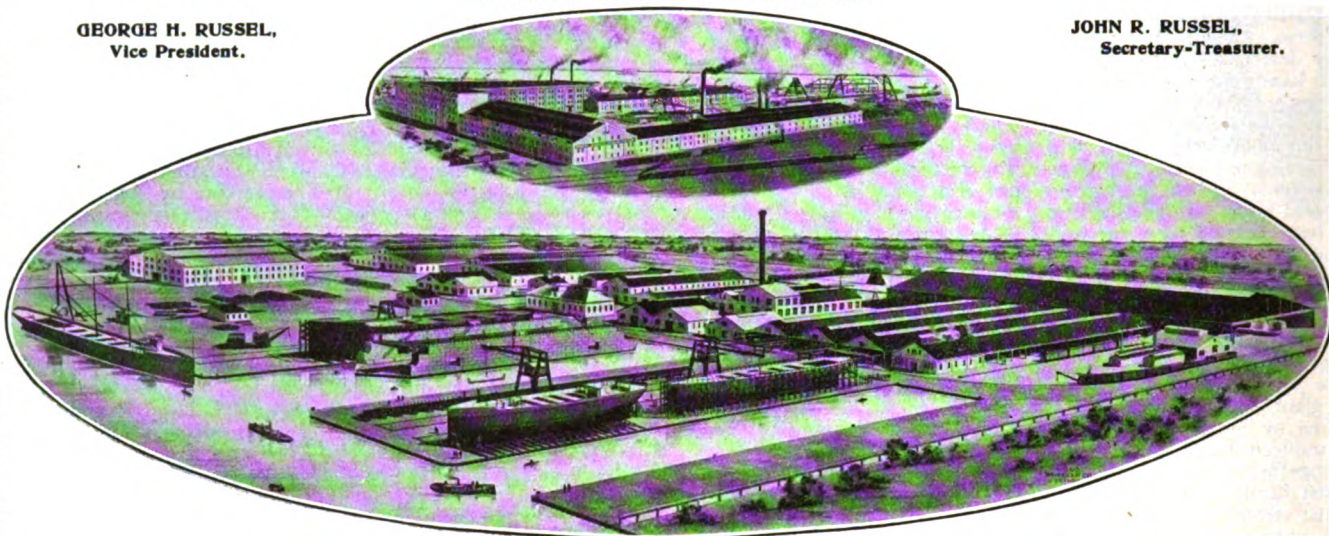
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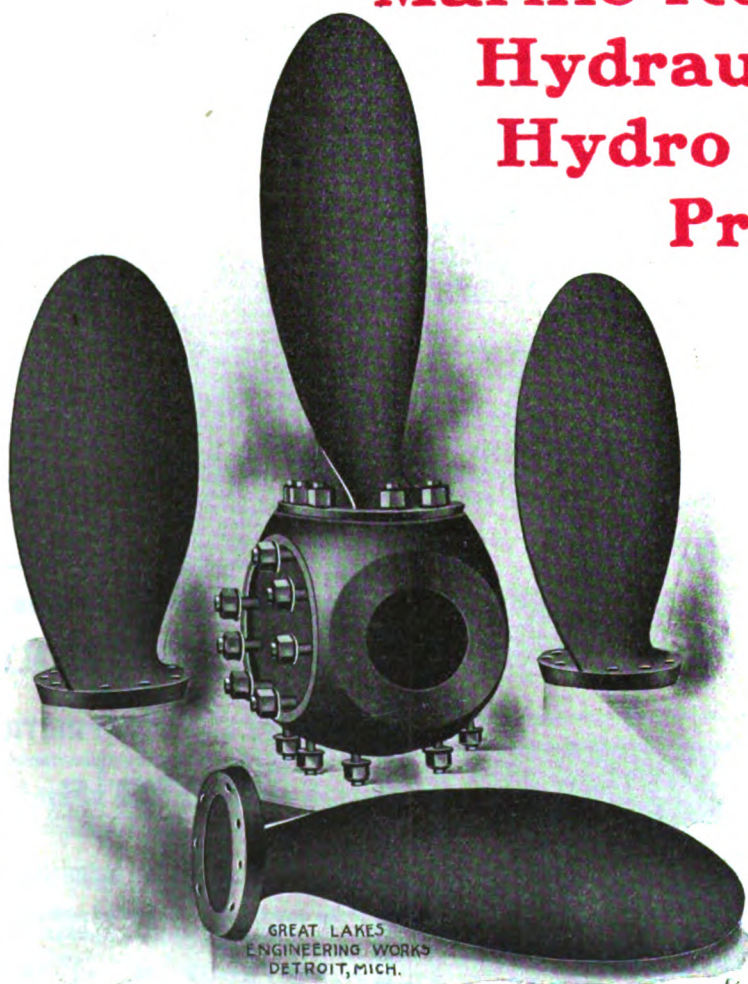
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AND MARINE RECORD.

VOL. XXVIII.

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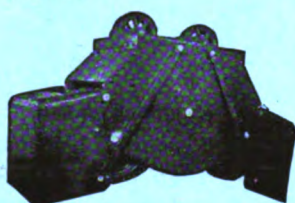
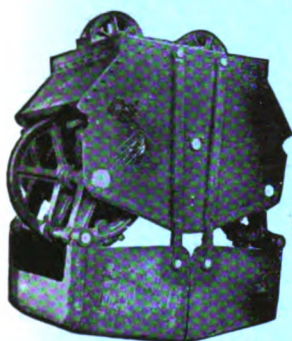
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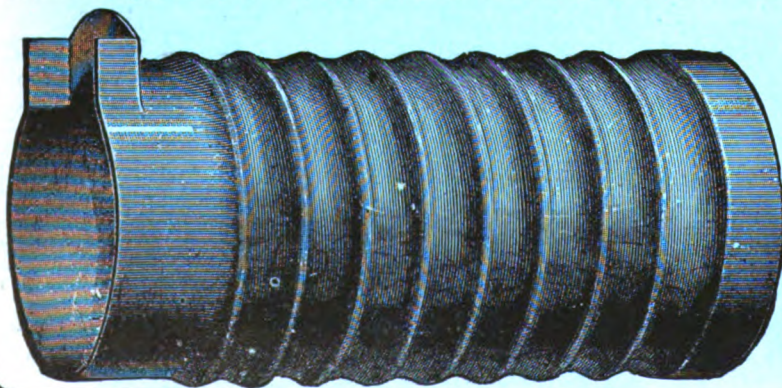
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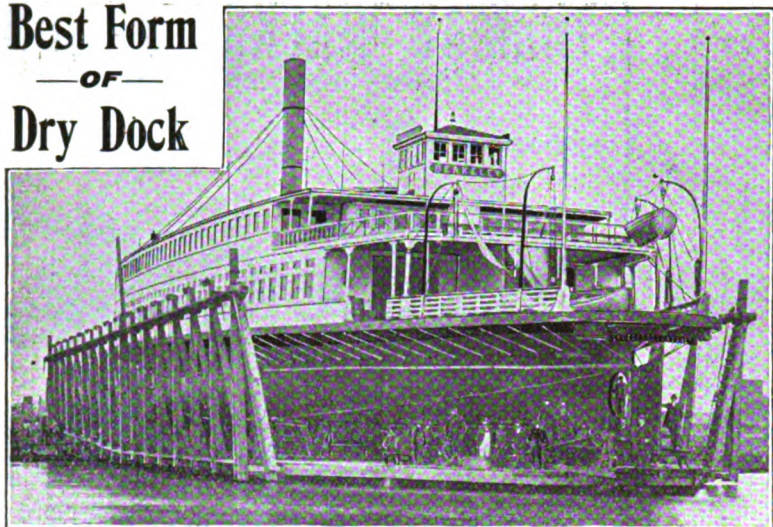
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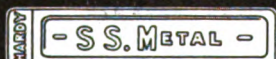
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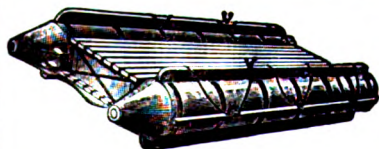
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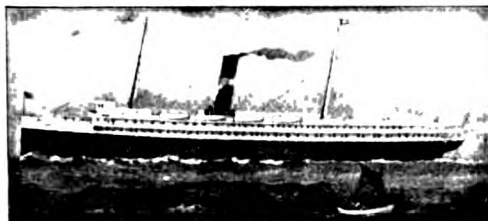
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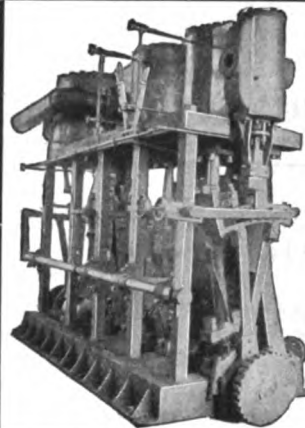
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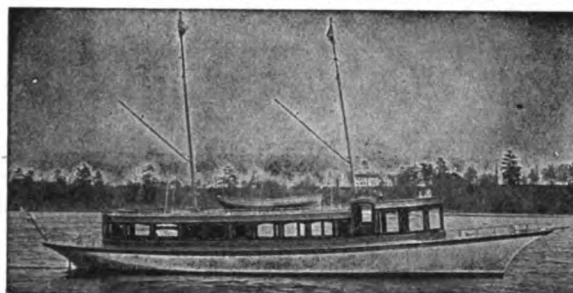
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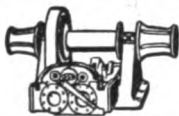
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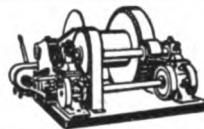
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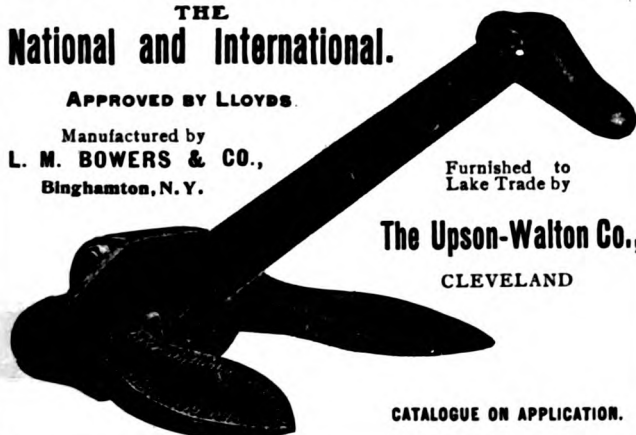
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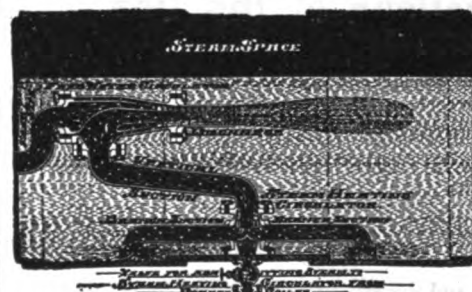
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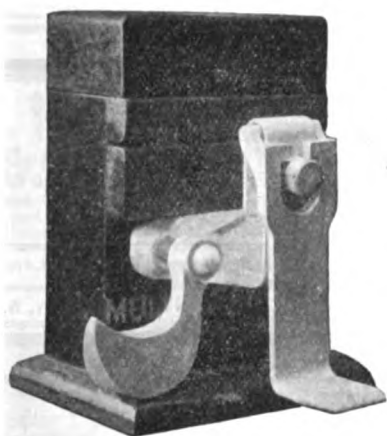
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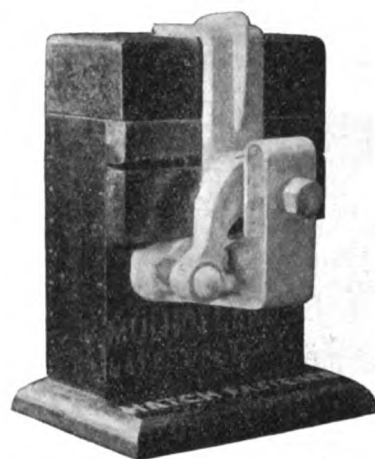


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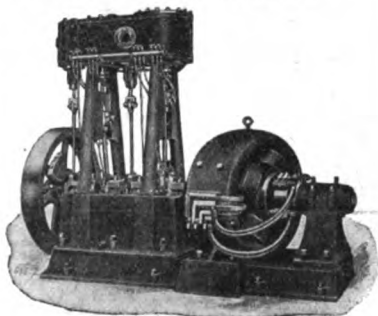
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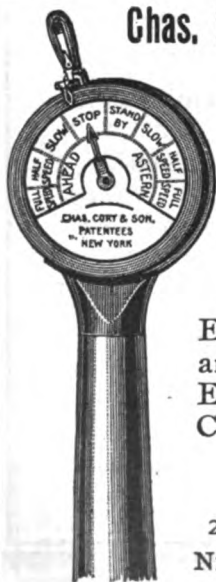
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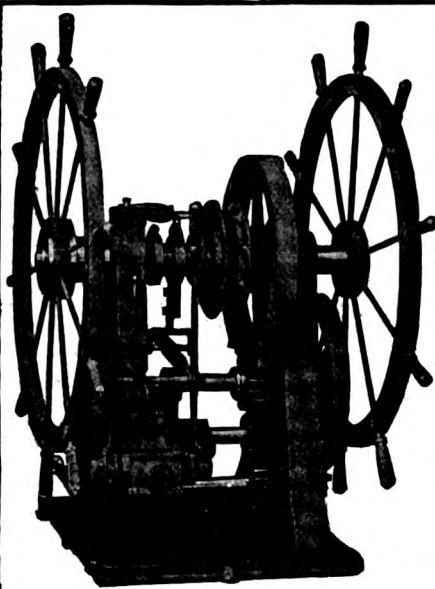


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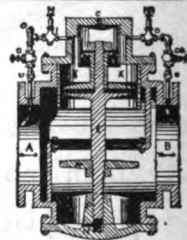
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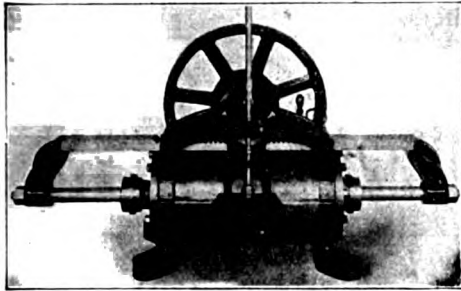
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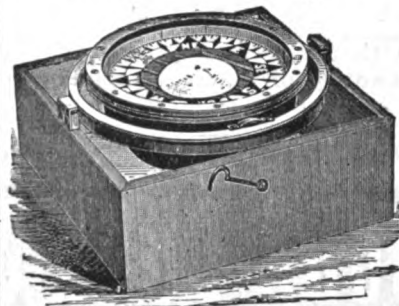
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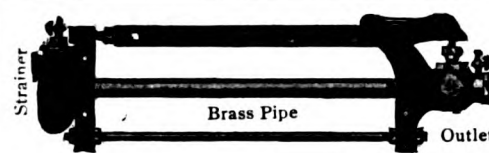
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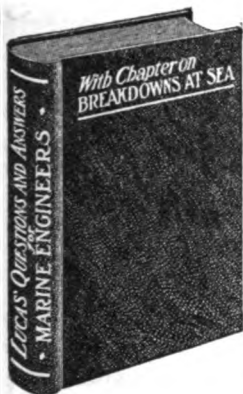
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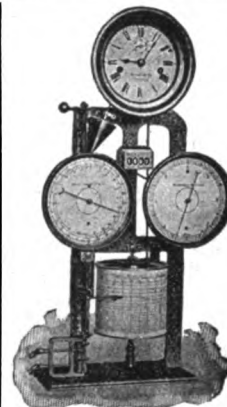
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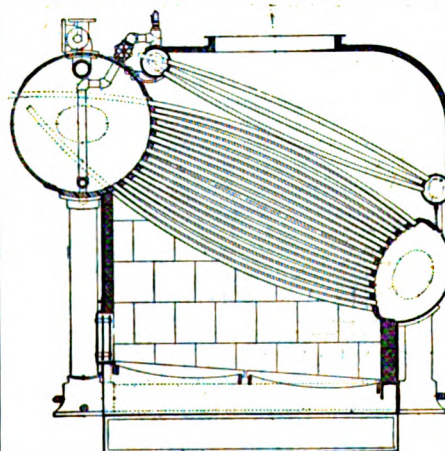
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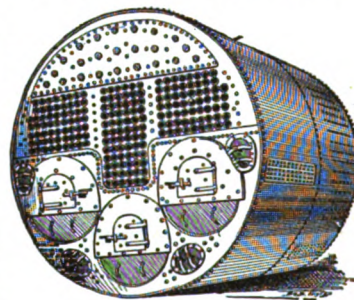
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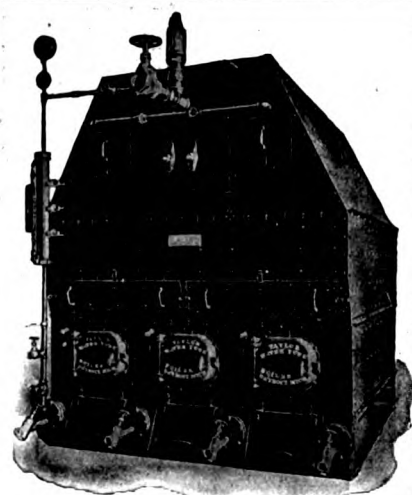
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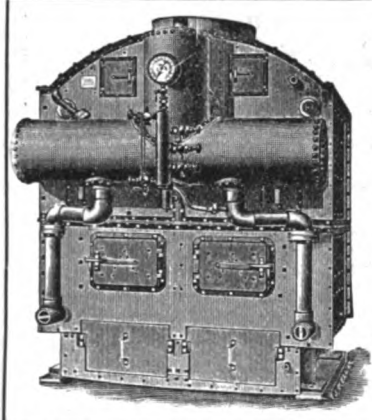
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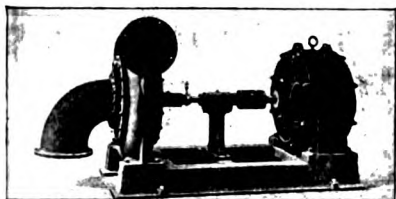
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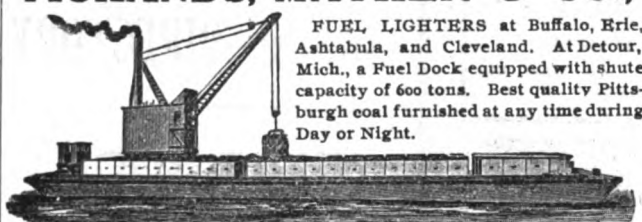
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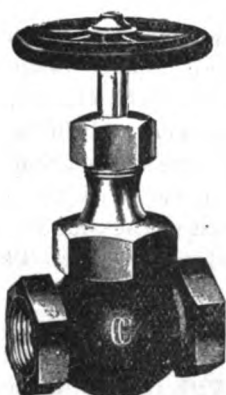
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Poe Lock, with Whaleback.

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 Mariner's Harbor, S. I., N. Y.  
 Truscott Boat Mfg. Co., St. Joseph, Mich.  
 Warrington Iron Works, Chicago.  
 Willard, Chas. P., Chicago.

**LIFE FLOATS.**

Carley Life Float Co., New York.

**LIFE PRESERVERS, LIFE BOATS, BUOYS.**

Armstrong Cork Co., Pittsburgh.  
 Carley Life Float Co., New York.  
 Drein, Thos. & Son, Wilmington, Del.  
 Kuhnweiller's Sons, D., New York.  
 Lane & DeGroot, Long Island City, N. Y.  
 Marine Construction & Dry Dock Co., New York.  
 Mariner's Harbor, S. I., N. Y.  
 Rippley Hardware Co., Grafton, Ill.

**LIGHTS, SIDE AND SIGNAL.**

Helvig, H. A. J., New York.  
 Russell & Watson, Buffalo.

**LOGS.**

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 Nicholson Ship Log Co., Cleveland.  
 Walker & Sons, Thomas, Birmingham, Eng.  
 Also Ship Chandlers.

**LUBRICATING GRAPHITE.**

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Crane Co., Chicago.  
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**LUMBER.**

Martin-Barriss Co., Cleveland.  
 Moran Bros. Co., Seattle, Wash.  
 Shurick, F. S., New York.

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 Siegel Cooper Co., New York.

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 Detroit Ship Building Co., Detroit.  
 Sturtevant, B. F. Co., Boston.

**METALLIC PACKING.**

Hayden Mfg. Co., N. L., Columbus, O.  
 Katzenstein, L. & Co., New York.  
 U. S. Metallic Packing Co., Philadelphia.

**METAL POLISH.**

Bertram's Oil Polish Co., Boston.

**MOTORS, GENERATORS—ELECTRIC.**

Elwell-Parker Electric Co., Cleveland.  
 General Electric Co., Schenectady, N. Y.  
 Sturtevant, B. F. Co., Boston.  
 Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.

**NAUTICAL INSTRUMENTS.**

Bliss, John & Co., New York.  
 Ritchie, E. S. & Sons, Brookline, Mass.

**NAUTICAL SCHOOLS.**

Chicago Nautical School, Chicago.  
 Gould's Navigation School, Cleveland.  
 McNevin's Navigation School, Detroit.  
 McNevin's Navigation School, San Francisco.  
 Seattle Nautical School, Seattle, Wash.

**NAVAL ARCHITECTS.**

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 Kidd, Joseph, Duluth, Minn.  
 Logan, Robert, Cleveland.  
 Matteson & Drake, Philadelphia.  
 Mosher, Chas. D., New York.  
 Newman, R. L., New York.  
 Radler, Perkins & Field, New York.  
 Wood, W. J., Chicago.

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DeGrauw, Aymar & Co., New York.  
 Stratford Oakum Co., Jersey City, N. J.

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 Standard Oil Co., Cleveland.  
 United States Graphite Co., Saginaw, Mich.

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 Jenkins Bros., New York.  
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 New York Belting & Packing Co., New York.  
 United States Metallic Packing Co., Philadelphia.

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 Detroit Varnish Co., Detroit.  
 Detroit White Lead Works, Detroit.  
 New Jersey Zinc Co., New York.  
 Sipe & Co., James B., Allegheny, Pa.  
 United States Graphite Co., Saginaw, Mich.  
 Upson-Walton Co., Cleveland.

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Cramp, Wm. & Sons. .... Philadelphia.  
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Fore River Ship & Engine Co. .... Quincy, Mass.  
Great Lakes Engineering Works. .... Detroit.  
Hyde Windlass Co. .... Bath, Me.  
Jenks Ship Building Co. .... Port Huron, Mich.  
Lockwood Mfg. Co. .... East Boston, Mass.  
Macbeth Iron Co. .... Cleveland.  
Maryland Steel Co. .... Sparrow's Point, Md.  
Milwaukee Dry Dock Co. .... Milwaukee.  
Newport News Ship Building Co. .... Newport News, Va.  
Phosphor Bronze Smelting Co., Ltd. .... Philadelphia.  
Ridson Iron Works. .... San Francisco.  
Roelker, H. B. .... New York.  
Sheriffs Mfg. Co. .... Milwaukee.  
Superior Shipbuilding Co. .... Superior, Wis.  
Thropp & Sons Co., J. E. .... Trenton, N. J.  
Trout, H. G. .... Buffalo.  
United States Ship Building Co. .... New York.

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Westinghouse Electric & Mfg. Co. .... Pittsburg, Pa.

## PUMPS FOR VARIOUS PURPOSES.

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Kingsford Foundry & Machine Wks. Oswego, N. Y.  
"Long-Arm" System Co. .... Cleveland.

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## RANGES.

Russell & Watson ..... Buffalo.  
Siegel Cooper Co. .... New York.

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Roelker, H. B. .... New York.

## REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register ..... Cleveland.  
Record of American & Foreign Shipping. .... New York.

## RIVETING MACHINES.

Allen, John F. .... New York.

## RIVETS, STEEL, FOR SHIPS AND BOILERS.

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Ashton Valve Co. .... Boston.  
Crane Co. .... Chicago.  
Hayden Mfg. Co., N. L. .... Columbus, O.  
Lunkenheimer Co. .... Cincinnati.

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Upson-Walton Co. .... Cleveland.  
Wilson & Silsby ..... Boston.

## SALVAGE COMPANIES.

See Wrecking Companies.

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Gould's Navigation School. .... Cleveland.  
McNevin's Navigation School. .... Detroit.  
McNevin's Navigation School. .... San Francisco.  
Seattle Nautical School. .... Seattle, Wash.

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General Electric Co. .... Schenectady, N. Y.  
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Shipowners Dry Dock Co. .... Chicago.  
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Moran Bros. Co. .... Seattle, Wash.  
Shurick, F. S. .... New York.

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King, Rufus S. .... New York.  
McCarthy, T. R. .... Montreal, Can.  
Newman, B. L. .... New York.  
Weeks, F. H. .... New York.

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## STEEL CASTINGS.

Seaboard Steel Casting Co. .... Chester, Pa.  
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## STEERING APPARATUS.

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Deke Engine Co. .... Grand Haven, Mich.  
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Jenkins Bros. .... New York.  
Kieley & Mueller ..... New York.  
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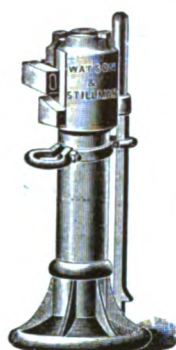
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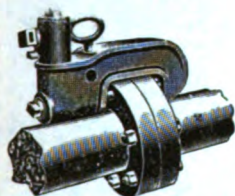


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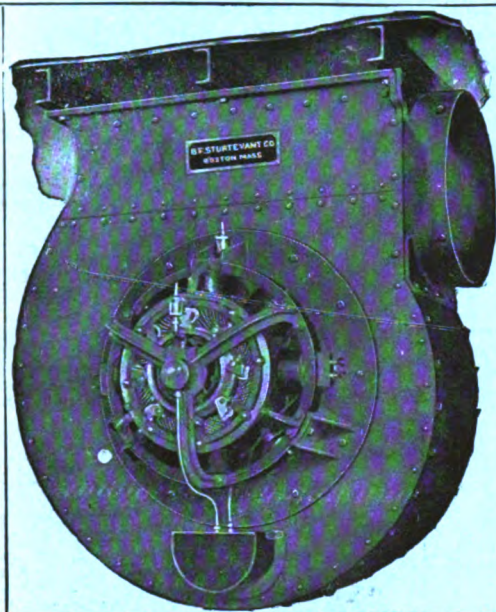
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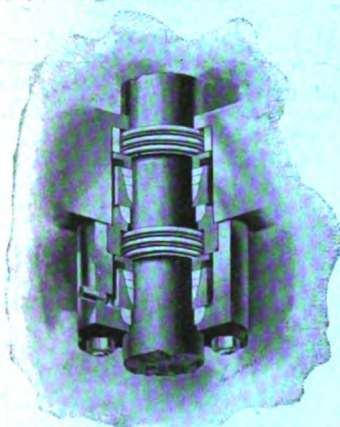
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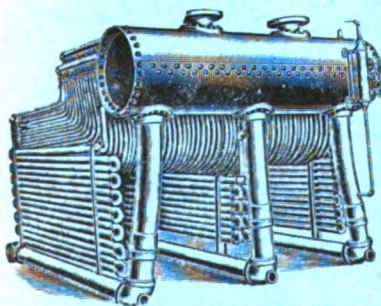
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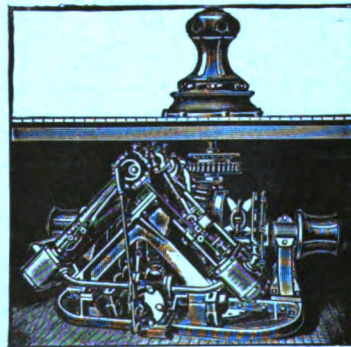
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